DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103
Semester Winter Examination – Nov - 2019

Branch: Electrical Engineering   **Sem.:- IV**

Subject with Subject Code:- Power System I (BTEEC402)   **Marks: 60**

Date:- 26/11/2019   **Time:- 3 Hr.**

Instructions to the Students
1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

		(Marks)
Q.1.	**Attempt the following questions**	
a)	Enlist and explain different sources of electrical energy	**(4)**
b)	A consumer has following connected load: 10 lamps each of 60W 2 heaters each of 100W Maximum demand 1500W On the average he uses 8 lamps for 5 hours per day, each heater 3 hours per day. Find i) average load , ii) monthly energy consumption, iii) load factor	**(4)**
c)	Enlist and explain different types of turbines and their selection	**(4)**
Q.2.	**Attempt the following questions**	
a)	Explain the role of excitation system, transformer, control panel, metering and other control equipment in power system.	**(6)**
b)	Derive an expression for loop inductance of a single phase line	**(6)**
Q.3.	**Attempt the following questions**	
a)	Derive the expression for capacitance of three phase line with symmetrical spacing	**(6)**
b)	Explain the effect of earth on three phase transmission line parameter	**(6)**

P.T.O.

Q.4. **Attempt the following questions**

a) Explain the terms skin effect, Ferranti effect and proximity effect. **(6)**

b) Derive an expression for string efficiency. Also explain various methods to improve string efficiency. **(6)**

Q.5. **Attempt the following questions**

a) Give classification and representation of transmission lines. **(6)**

b) A single phase line transmits 1000kW at 10kV At a p.f. of 0.85 lagging. It has total loop resistance of 2 ohm and inductive reactance of 3 ohm. Determine (i) voltage regulation, (ii) transmission efficiency. **(6)**

Q.6. **Attempt the following questions**

a) Explain the phenomenon of corona. With various factors effecting on corona enlist its disadvantages **(6)**

b) The towers of height 30m and 90m respectively support a transmission line conductor at water crossing. The horizontal distance between the towers is 500m. if the tension in the conductor is 1600kg, find the minimum clearance of the conductor and water, and clearance midway between the supports. Weight of conductor is 1.5 kg/m. Bases of the towers can be considered to be water level. **(6)**

Paper End

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103
Semester Examination Winter– Nov– 2019

Branch: ELETRICAL ENGINEERING   Sem.:-IV

Subject: Electrical Machine-I (BTEEC401)   Marks: 60

Date: - 28/11/2019   Time:- 3 Hr.

Instructions to the Students
1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

                                                                  (Marks)

Q.1 a) What is the three-phase transformer? Compare the advantages and limitations of a single unit of three winging transformer with a bank of three single- phase units forming a three phase transformer.   **(6)**

b) i) Write down EMF equation of single phase transformer and Derive the condition for maximum efficiency of single phase transformer.   **(6)**

Or

ii) Explain in details hysteresis and Eddy- current losses in the magnetic circuit

Q.2 a) What is the necessity of parallel operation of transformer? Discus the condition to be satisfied for parallel of two transformers.   **(6)**

b) i) A 3-phase bank of three single-phase transformer are fed from 3-phase 33kv (Line-to-line) it supplies a land of 6000kVA at 11 kV (line-to-line). Both supply and load are 3-wire. Calculate the voltage and kVA rating of single-phase transformer for all possible 3-phase transformer connection.   **(6)**

Or

ii) Explain open delta and scott connection in three-phase transformer with neat diagram.

Q.3 a) Explain construction and Working of DC machine with neat diagrams.   (6)

b) Derive the equation for mechanical force acting on current carrying   (6)
conductor placed in magnetic field.

Q.4 a) Draw a neat diagram of lap and wave winding used in a DC Machine.   (6)
Distinguish between the this windings

b) An 8kW, 230 V, 1200 rpm DC shunt motor has Ra=0.7 ohm. The field   (6)
current is adjusted until, on no load with a supply of 250V, the motor
runs at 1250 rpm and draws armature current of 1.6 A. A load torque is
the applied to the motor shaft, which causes the Ia to rise to 40 A, and
the speed falls to 1150 rpm. Determine the reduction in the flux per pole
due to the armature reaction.

Q.5 a) Why starter is necessary for DC motor? Describe with neat diagram   (6)
working of three-point starter.

b) From basic principles derive the expression of shift torque equation of   (6)
DC motor.

Q.6 a) Explain construction and working of reluctance motor.   (6)
b) Explain the permeant magnet stepper motor and their applications.   (6)

_____Paper End_____

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103
Winter Semester Examination (Supplementary) – Nov. - 2019

Branch: Electrical Engineering
Subject: - Electrical Installation & Estimation (BTEEC403)
**Date: - 30/11/2019**

Sem.:- III
Marks: 60
Time: - 3 Hr.

Instructions to the Students
1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

(Marks)

Q.1. a) What are the points to be consider while selecting size of conductor? (06)

b) Describe purchase system and objective of purchase? (06)

Q.2. a) What are the points to be consider while preparing the estimate (04)

b) The plan of drawing hall showing the position of electrical point is given in figure. Estimate the quantity of material required for concealed conduit wiring when 230V, 50 Hz A.C supply is available. Assume the height of ceiling to be 4m also draw a circuit diagram and wiring plan indicating the position of distribution board. (08)

Fig. Installation Plan
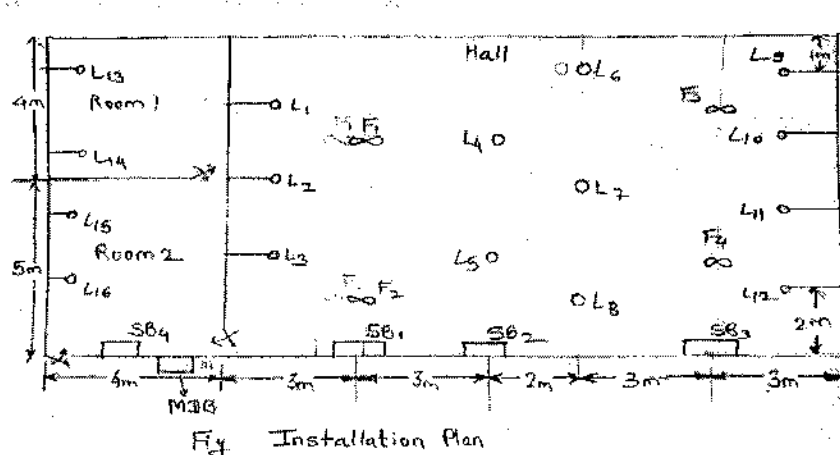
Q.3. a) A room is to be wired for single phase A.C. supply directly taken from mains which declared voltage of 200V.The length of wire from the main switch to light and plug point is 30m.If the wire is to carry 5A, determine the size of the conductor. (Data table are given on last page) (06)

b) Explain centralized purchase and decentralized purchase in detail?   (06)

Q.4. a) Explain Married joint and a tape joint?   (06)

b) Explain properties of different conductor used in different application?   (06)

Q.5. a) Describe different tools used in electrical wiring system?   (06)

b) Write down brief specification for followings: (06)
    i) AC Energy meter for domestic use.
    ii) Main switch
    iii) Tumbler switch

Q.6. a) Write a short note on cleat wiring system   (06)

b) Explain Indian Electricity Rules: (06)
    i) IE Rules 58.
    ii) IE Rules 77.
    ii) IE Rules 79.

Current ratings and voltage drop for vulcanised rubber PVC or polythene insulated or tough Rubber PVC lead sheathed single core aluminium wires or cables

Size of Conductor		2 Cables d.c. or Single-phase a.c.		3 or 4 cables of balanced 3-phase		4 Cables d.c.	
Normal area sq. mm.	Number and diameter of wire in mm.	Current rating in amperes	Approx. length of run for volt drop in metres	Current rating in amperes	Approxi. length of run for 1 volt drop in metres	Current rating in amperes	Approx. length of run for 1 volt drop in metres
1.5	1/1.40	10	2.3	9	2.9	9	2.5
2.5	1/1.80	15	2.5	12	3.6	11	3.4
4.0	1/2.24	20	2.9	17	3.9	15	4.1
6.0	1/2.80	27	3.4	24	4.3	21	4.3
10.0	1/3.55	34	4.3	31	5.4	27	5.4

Data Table: for Q.3a)

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103
Supplementary Winter Semester Examination – Dec. – 2019

Branch: Electrical and Electronics Engineering   **Sem.:- IV**
Subject:- Numerical Methods and Programming (BTEEC404)   **Marks: 60**
Date:- 02-12-2019   **Time:- 3 Hr.**

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Instructions to the Students
1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

                                                         (Marks)

Q.1. Answer the following   **(12)**
a) What is MATLAB? Explain any six standard functions used in MATLAB.
b) Explain different array operations using MATLAB.

Q.2. Answer the following   **(12)**
a) Illustrate different types of errors with suitable example.

b) Approximate the function $f(x)=\cos(x)$ at $x_{i-1}=\frac{\pi}{3}$ on the basis of the value of $f(x)$ and its derivatives at $x_i=\frac{\pi}{4}$. Use Taylors series expansion with n=0 to 6.

Q.3. Answer any TWO the following (6 Marks each)   **(12)**
a) Find the value of $\cos(x)$ at $x=1.74$ from data given as:

x	1.7	1.74	1.78	1.82	1.86
sin(x)	0.9916	0.9857	0.9781	0.9691	0.9584

b) Illustrate Trapezoidal rule and Simpsons One-Third rule for Numerical Integration.

c) Apply the Trapezoidal Rule to estimate the value of $\int_0^2 e^x \, dx$ taking the the number 10 intervals.

Q.4. Answer any TWO the following (6 Marks each)   **(12)**
a) Apply Gauss Elimination method to solve the equations:
$$x+4y-z=-5$$
$$x+y-6z=-12$$
$$3x-y-z=4$$
b) Illustrate Iterative methods for solving Linear equations.

c) Use the Newton-Raphson method to estimate the root of $f(x)=e^{-x}-x$, employing the $x_0=0$.

Q.5. Answer any TWO the following (6 Marks each)   (12)

a) Fit a straight line to the following set of data. Also plot the line.

x	1	2	3	4	5
y	3	4	5	6	7

b) Estimate the Lagrange interpolation polynomial to fit the following data

i	0	1	2	3
x_i	0	1	2	3
$e^{x_i}-1$	0	1.7183	6.3891	19.0855

Use the polynomial to estimate the value of $e^{1.5}$.

c) Explain the MATLAB function **spline** and **pchip** with suitable example.

Q.6. Answer the following   (12)

a) Determine an approximate value of y corresponding to $x=1$, using Euler's metod. Given that $\frac{dy}{dx}=x+y$ and $y=1$ when $x=0$.

b) Apply Runge-Kutta fourth order method to solve $\frac{dy}{dx}=\frac{y^2-x^2}{y^2+x^2}$ with $y(o)=0$ at $x=0.2, 0.4$.

Paper End

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

Semester Examination – December - 2019

Branch: Electrical and Electronics Engineering   Sem:- IV

Subject:- Analog and Digital Electronics (BTEEE406B)   Marks: 60

Date:- 04/12/2019   Time:- 3 Hr.

Instructions to the Students
1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly


Que. No. 1

a) How transistor is used as an amplifier.   (4 M)

b) Explain Crossover Distortion in Amplifiers.   (8 M)

Que. No. 2

a) List and State any four characteristics of an ideal OPAMP.   (6 M)

b) Explain inverting amplifier configuration of an operational amplifier and derive the expressions for its gain.   (4 M)

Find the gain of the inverting amplifier shown below, Consider $R_1 = 1k\Omega$ and $R_F = 10k\Omega$.
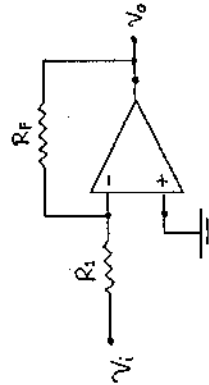
For the circuit shown, if the OP-AMP can source maximum of 15mA current, then find the maximum current that the circuit can deliver to next stage.
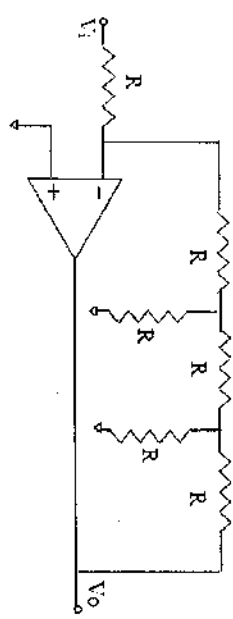
when
   i. $R_F : R_1 = 1k\Omega : 100\Omega$.
   ii. $R_F : R_1 = 10k\Omega : 1k\Omega$.
   iii. $R_F : R_1 = 100k\Omega : 10k\Omega$

Assume maximum swing of OP-AMP = 0 to 10 V.

Que. No. 5

a) The Boolean expressions simplifies to: (6 M)

   i) $(A + B)'(A + B)'$

   ii) $(X + Y)(X + Y')$

   iii) $(B + BC)(B + BC)(B + D)$

b) Find the simplest equation which implements the K-map represented by the following Sum of Products expression of logic function $f(W,X,Y,Z) = \Sigma(0, 1, 2, 8, 11) + d(3, 9, 15)$.   (4 M)

c) Find the simplest equation which implements the K-map shown below is   (2 M)

	$\bar{C}$	C
$\bar{A}\bar{B}$	0	0
$\bar{A}B$	1	1
AB	1	1
$A\bar{B}$	0	1

Que. No. 6

a) Implement the Boolean functions: (6 M)

   i) $F = x'y'z + x'yz' + xyz'+xyz$ using a 4:1 MUX

   ii) $F=A'B'C'D+A'BC'D'+A'BC'D+AB'CD+ABC'D'+ABC'D+ABCD'+ABCD$ using an 8:1 MUX

b) Design four bit Binary to Gray Code Converter.   (6 M)

********* All the Best *********

c) Find the gain of the circuit shown below. (4 M)

Que. No. 3

a) Convert the given numbers into equivalent numbers of their other number systems. (4 M)

Decimal	Binary	Octal	Hexa-decimal
33			
	1110101		
		703	
			1AF

b) How many minimum numbers of 2-input NAND gates are required for implementing a 2-input XOR and XNOR functions and also draw their equivalent logic gates diagram using NAND gates only. (4 M)

c) i) State the De-Morgan's theorem of Boolean algebra and Simplify complement of the function X + YZ using De-Morgan's theorem.

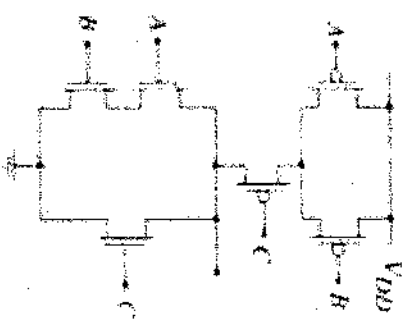ii) Which gate is equivalent to the given circuit? (4 M)
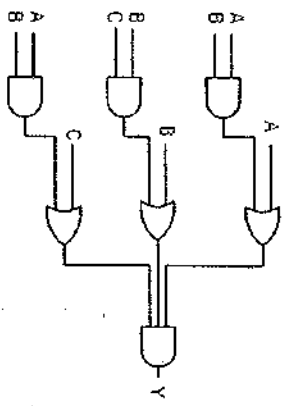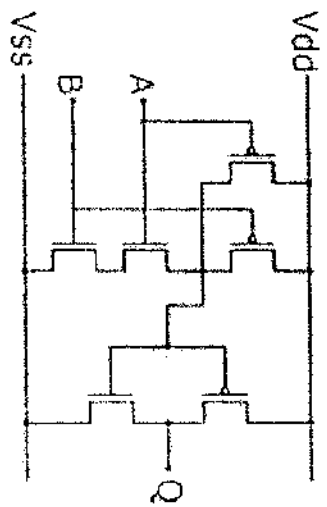

Que. No. 4

a) Convert the flipflops: (6 M)

i) SR to D

ii) JK to T

b) Which logic function is implemented by CMOS complex logic structure shown in figure below? (4 M)

i)

ii)

c) The Boolean expression $f(A,B,C,D) = \Sigma (3, 7, 11, 13, 14, 15)$ simplifies to: (2 M)

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

End Semester Examination – Winter 2019

Course: B. Tech in   Sem: III

Subject Name: Engineering Mathematics-III (BTBSC301)   Marks: 60

Date: 10/12/2019   Duration: 3 Hr.

Instructions to the Students:
1. *Solve ANY FIVE questions out of the following.*
2. *The level question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	Attempt the following.		12
A)	Find $L\left\{cosht \int_0^t e^u \, coshu \, du\right\}$.	Analysis	4
B)	If $f(t) = \begin{cases} t, & 0 < t < \pi \\ \pi - t, & \pi < t < 2\pi \end{cases}$ is a periodic function with period 2π. Find $L\{f(t)\}$.	Analysis	4
C)	Using Laplace transform evaluate $\int_0^\infty e^{-\alpha t} \frac{sin^2 t}{t} \, dt$	Evaluation	4
Q. 2	Attempt any three of the following.		12
A)	Using convolution theorem find $L^{-1}\left\{\frac{1}{s(s+1)(s+2)}\right\}$	Application	4
B)	Find $L^{-1}\{\bar{f}(s)\}$, where $\bar{f}(s) = log\left(\frac{s^2+1}{s(s+1)}\right)$	Analysis	4
C)	Using Laplace transform solve $y'' + 2y' + 5y = e^{-t} \sin t$; $y(0) = 0$, $y'(0) = 1$	Application	4
D)	Find $L^{-1}\left\{\frac{s^2+2s-4}{(s-5)(s^2+9)}\right\}$	Analysis	4
Q. 3	Attempt any three of the following.		12

EC2FA3D0100FD3760E4B79796AAC06EC

		Bloom Level	Marks
Q.4	**Attempt any three of the following:**		**12**
A)	Express the function $f(x) = \begin{cases} \sin x, & 0 \le x \le \pi \\ 0, & x > \pi \end{cases}$ as a Fourier sine integral and hence evaluate that $\int_0^\infty \frac{\sin \lambda x \, \sin \lambda \pi}{1-\lambda^2}\, d\lambda$.	Evaluation	4
B)	Using Parseval's identity for cosine transform, evaluate $\int_0^\infty \frac{dx}{(x^2+a^2)(x^2+b^2)}$.	Application	4
C)	Find the Fourier sine transform of $f(x) = \begin{cases} x, & 0 \le x \le 1 \\ 2-x, & 1 \le x \le 2 \\ 0, & x > 2 \end{cases}$.	Analysis	4
D)	If $F_s\{f(x)\} = \frac{e^{-as}}{s}$, then find $f(x)$. Hence obtain the inverse Fourier sine transform of $\frac{1}{s}$.	Analysis	4
Q.5	**Attempt the following.**		**12**
A)	Form the partial differential equation by eliminating arbitrary function f from $f(x^2 + y^2 + z^2, 3x + 5y + 7z) = 0$	Synthesis	4
B)	Solve $pz - qz = z^2 + (x+y)^2$	Application	4
C)	Determine the solution of one dimensional heat equation $\frac{\partial u}{\partial t} = c^2 \frac{\partial^2 u}{\partial x^2}$ where the boundary conditions are $u(0,t) = 0$, $u(l,t) = 0$ $(t > 0)$ and the initial condition $u(x,0) = x$, l being the length of the bar.	Application	4
D)	Use the method of separation of variables to solve the equation $\frac{\partial u}{\partial x} = 2\frac{\partial u}{\partial t} + u$, given that $u(x,0) = 6e^{-3x}$.	Application	4
Q.6	**Attempt the following.**		**12**
A)	Determine the analytic function $f(z)$ in terms of z whose real part is $\frac{\sin 2x}{\cosh 2y - \cos 2x}$	Analysis	4
B)	Prove that $u = x^2 - y^2 - 2xy - 2x + 3y$ is harmonic. Find a function v such that $f(z) = u + iv$ is analytic.	Analysis	4
C)	Find the bilinear transformation which maps the points $z = 0, -1, -i$ onto the points $w = i, 0, \infty$. Also, find the image of the unit circle $|z| = 1$.	Analysis	4

		Bloom Level	Marks
A)	Use Cauchy's integral formula to evaluate $\oint_C \frac{\sin \pi z^2 + \cos \pi z^2}{(z-1)(z-2)}\, dz$, where C is the circle $|z| = 3$.	Evaluation	4
B)	Find the poles of function $\frac{z^2-2z}{(z+1)^2(z^2+4)}$. Also find the residue at each pole.	Analysis	4
C)	Evaluate $\oint_C \frac{e^z}{\cos \pi z}\, dz$, where C is the unit circle $|z| = 1$.	Evaluation	4

*** **Paper End** ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

Winter Semester Examination – Dec. -2019

Branch: S. Y. B. Tech (Electrical Engineering)   **Sem.:- III**
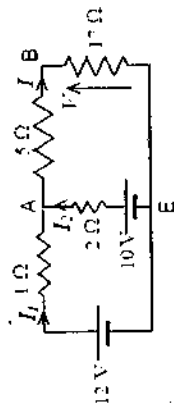**Subject:-** Network Analysis & Synthesis- BTEEC302   **Marks: 60**
Date:- 12/12/2019   **Time:- 3 Hr.**

(Marks)

Q.1. a) Find I in the circuit shown in below Fig. by using superposition theorem   (6)

b) Define the following terms :-

(i) Unilateral element   (ii) Bilateral element   (iii) Linear element

(iv) non-linear element.   (6)

Q.2. a) Draw oriented GRAPH for given electrical network.   (6)
Find 1) Rank of graph 2) Number of Branches 3) Number of Trees 4) Number of Twigs
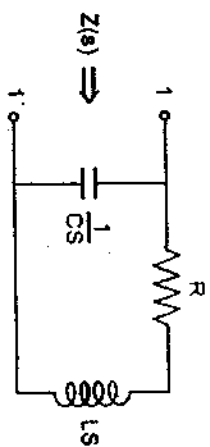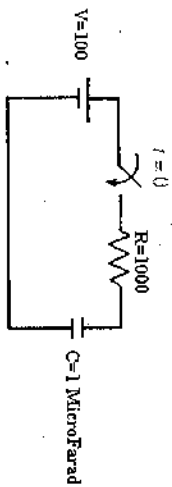5) Number of Links/ Chords

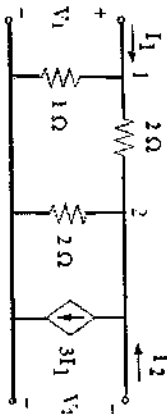b) By using the supernode concept find out the node voltages V_1 & V_2 (6)
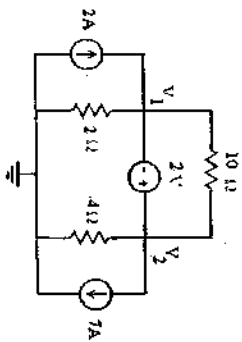
ii) (3)

Q.3. a) In the circuit shown in Fig. the switch is closed at t=0 Find the values of i, $\frac{di}{dt}$ and $\frac{d^2i}{dt^2}$ at t=0$^+$ if R=1000Ω, C=1µF and V=100V. Capacitor is initially uncharged. (6)

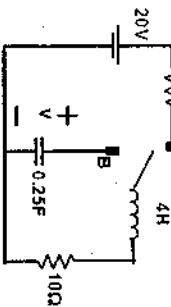V=100   R=1000   C=1 MicroFarad

b) In the circuit shown in Fig., the switch is moved from A to B at t=0. Find v(t) for t>0. (6)

20V   30Ω   A   B   4H   0.25F   V   10Ω

Q.4. a) State and Prove Convolution integral theorem for Laplace transform. (6)
b) Find out $Z_{11}(S)$ and $Y_{11}(S)$ of networks shown below.
(i) (6)

R $\frac{1}{CS}$ LS   Z(s)

(i) (3)

Q.5. **Solve Any TWO**
a) Find Y and Z parameters for the network shown in Fig. which contains a current controlled source. (6)

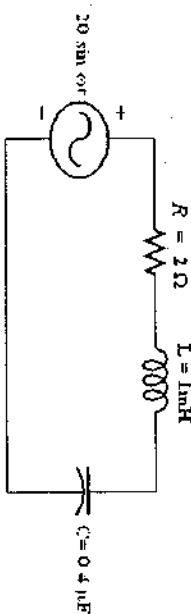I_1 2 Ω   1 Ω   2 Ω I_2
V_1 $3I_1$ V_2

b) State and prove the symmetry & reciprocity conditions for transmission line parameters. (6)
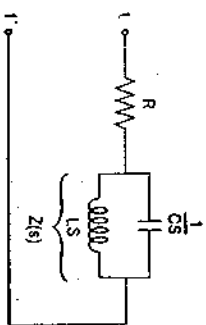c) The Z Parameter of A Two Port Network Are Z11= 20 Ω, Z22= 30 Ω, Z12=Z21=10 Ω. Find Y And ABCD parameters. (6)

Q.6. a) In the circuit in Fig., R = 2 &, L = 1 mH, and C = 0.4 µF, (6)
(i) Find the resonant frequency and the half-power frequencies.
(ii) Calculate the quality factor and bandwidth.
(iii) Determine the amplitude of the current at ω0, ω1, and ω2.

20 sin ωt   R = 2 Ω   L = 1mH   C = 0.4 µF

b) Write a note on Low pass & High pass, Band pass & band reject filter. (6)

Paper End

Branch: Electrical Engineering   Sem.:- III
Subject with Subject Code:- Fluid Mechanics and Thermal Engineering(BTEEC303) Marks: 60
Date:- 14/12/2019   Time:- 3 Hr.

Instructions to the Students
1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

(Marks)

Q.1. a) Define viscosity and deduce the units of viscosity. Explain the effect of temperature on viscosity for liquids and gases.   (06)

b) The space between two square flat parallel plates is filled with oil. Each side of the plate is 60cm. The thickness of the oil film is 12.5mm. The upper plate, which moves at 2.5 m/sec requires a force of 98.1 N to maintain the speed. Determine: i) the dynamic viscosity of the oil in poise, and ii) the kinematic viscosity of the oil in stokes if the specific gravity of oil is 0.95.   (06)

Q.2. a) Derive Darcy-Weisbach equation.   (06)

b) A main pipe divides into two parallel pipes which again forms one pipe. The length and diameter for the first parallel pipe are 2000m and 1m respectively, while the length and diameter of second parallel pipe are 2000m and 0.8m. Find the rate of flow in each parallel pipe, if total flow in the main is 3 m³/s. The coefficient of friction for each parallel pipe is same and equal to 0.005.   (06)

Q.3. a) Explain with help of suitable sketches, the working of two stroke cycle petrol engine.   (06)

b) Explain construction and working of closed cycle gas turbine.   (06)

Q.4. a) Explain construction and working of multistage air compressor   (06)

b) What is the difference between rotary and reciprocating compressor? Describe with neat sketch vane blower compressor.   (06)

Q.5. a) Explain working of vapour compression refrigeration system.

b) State the properties of good refrigerant. What are the normal refrigerants used.   (06)

Q.6. a) Define specific humidity, relative humidity and due point temperature. Draw psychrometric chart. (06)

b) Explain the following psychrometric processes.

   i) Sensible cooling ii) Sensible heating iii) Humidification and Dehumidification   (06)

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103
Winter Semester Examination – December - 2019

Branch: Electrical Engineering   **Sem.:- III**
Subject: - Measurement &Instrumentation (BTEEC304)   **Marks: 60**
Date: - 17/12/2019   **Time: - 3 Hr.**

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Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

                                                                            (Marks)

Q.1. **a)** Explain static and dynamic characteristics of measuring instruments   **(6)**
      b) What is Error? Explain the different types of errors?   **(6)**

Q.2. **a)** Draw and explain of MI instrument and derive the equation for damping torque?   **(6)**
      b) The inductance of moving iron ammeter is given by following expression $L = (20+10\Theta-2\Theta^2)$ μ H where, Θ is deflection in radians. The spring constant is 24×10^{-6} Nm/rad. Calculate the values of deflection for a current 5A.   **(6)**

Q.3. **a)** Explain the method used for measurement of Low Resistance?   **(6)**
      b) Which Bridge is preferred for measurement of unknown Inductance having Quality factor > 10 explain in detail?   **(6)**

Q.4. **a)** Explain the operation of Ramp type DVM with the help of block diagram and Waveform?   **(6)**
      b) Explain the operation of digital frequency meter with the help of block diagram?   **(6)**

Q.5. **a)** Explain the construction and working of linear variable differential transformer (LVDT)?   **(6)**
      b) Explain temperature measuring instrument and its type in detail?   **(6)**

Q.6. **a)** Write short notes on X-Y Recorder.   **(6)**
      b) Explain the Digital storage Oscilloscope?   **(6)**

<center>Paper End</center>

Branch: Electrical Engineering
Subject: Electrical Engineering Materials (BTEEE305A)
Date:- 19/12/2019

Sem.:- III
Marks: 60
Time:- 3 Hr.

Instructions to the Students
1. Each question carries 12 marks.
2. Attempt any five questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately Assume it and should mention it clearly

(Marks)

Q.1.
a) Explain various point defects in crystal (06)

b) Explain Braggs' law of X-ray diffraction. (06)

Q.2.
a) How do you distinguish between diamagnetic, paramagnetic & ferromagnetic materials (06)

b) What is hysteresis loop? What does it represent? Explain the significance? (06)

Q.3.
a) Explain classical free electron theory. (06)

b) What is superconductivity? Explain various properties of superconductivity? (06)

Q.4.
a) Explain Hall Effect? Derive expression for Hall voltage and Hall coefficient (06)

b) Explain the concept of Fermi level. (06)

P.T.O.

Q.5. a) Explain Dielectric Polarization (06)

b) Derive Clausius-Mosotti relation in Dielectrics. (06)

Q.6. a) Define Nanomaterial. Explain any two characterization (06) techniques of Nanomaterial

b) What is Carbon Nano Tubes? Explain Synthesis of Carbon (06) Nano Tubes & its application

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DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103
Winter Semester Examination – December - 2019

Branch: Electrical Engg.   **Sem.:-III**

Subject with Subject Code: -SIGNALS & SYSTEMS (BTEEE305C)   **Marks: 60**

Date: -19/12/2019   **Time: -3 Hr.**

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Instructions to the Students

    1. Each question carries 12 marks.

    2. Attempt any five questions of the following.

    3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.

    4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

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Q.1. **Attempt the following**   **(12)**

    a) What is signal? Define,Sketch and explain the Continuous Time and discrete time signals.

    b) I) Check whether the following signal is periodic or not. If signal is periodic find its fundamental period.

$$x(t)=\sin(\pi/4 \cdot t)+\cos(\pi/3)t$$

    II) Check the following systems for causality.

      i) $y(n)= 7*x(n)$

      ii) $y(n)= x(5-n)$

Q.2. **Attempt the following**   **(12)**

    a) what is system? Check the following system with respect to properties.

        i).Time Invariance

        ii). Linearity

        iii). Causality

$$y(n)= \sum_{k=-\infty}^{n} x(k)$$

    b) State and explain the properties of Discrete Time System.

OR

    b) I) Check the following system for stability

$$h(n) = (0.5)^n u(n)$$

    II) Check the following system for Linearity

        $y(n) = n*x(n)$

Q.3. **Attempt the following**   **(12)**

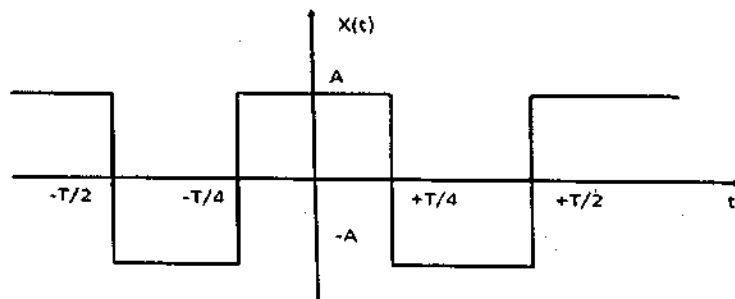   **a)** Find Fourier series representation of the waveform shown in fig.3.a

Fig. 3.a

b) Find the Laplace Transform of the following signals

$i \dot{} x(t) = \sin wt\, u(t)$

$ii \dot{} y(t) = t^3 + 3t^2 - 6t + 4$

OR

b) Find the Fourier Transform of x (t) = e^{-at} cos(bt) u(t) , t >0

Q.4. Attempt the following (12)

a) The LTI system having unit impulse response $h(t) = e^{-2t} u(t)$
Determine the output of the system to the input $x(t) \dot{} e^{-t} u(t)$.

b) Find the inverse Laplace transform of the following

$$X(s) = \frac{(s+7)}{(s \dot{} 2 - 3s - 10) \dot{}}$$

Q.5. Attempt the following (12)

a) i) State and explain the sampling theorem? What is the effect of under sampling? Explain.
ii) Compute the Nyquist sampling rate for the following signal ?
   x(t)= 5*cos(50πt)+ 8*Sin(300πt)

b) Find z-transform of x(n) =a^nu[n] +a^{-n}u[-n-1]. Sketch the ROC

Q.6. Attempt the following (12)

a) Find the convolution sum of the two DT sequences
   x(n)= (0.5)^{n}u(n)
   h(n) = u(n)
Sketch the output sequence.

b) Find the inverse z- transform of the following.

$$X(z) = \frac{2z^2}{(z+1)(z+2)^2}$$

********************** PAPER END**********************

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE - RAIGAD -402 103
Winter Semester Examination - Dec. - 2019

Branch: ELETRICAL ENGINEERING   Sem.:-III
Subject: ENGINEERING ECONOMICS (BTHM306)   Marks: 60
Date: - 21/12/2019   Time:- 3 Hr.

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Instructions to the Students
1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

                                                  (Marks)

Q.1 a) Write down definition of Economics and explain relationship between   (6)
Science, Engineering, Technology and Economic Development.

b) With a neat diagram, Explain production possibility curve with suitable   (6)
example and why is the curve concave to the origin?

Q.2 a) Consider the cash flows of the two projects A and B as shown in table   (6)
below. Determine the profitability index for both the projects. Assume an
annual discount rate of 8 % for each project. Also calculate payback period
of both the projects. Make a suitable comment about the better proposal.

	Project A	Project B
Capital Cost (Rs.)	30000	30000
Year	Net annual	Net annual
	savings (Rs.)	savings (Rs.)
1	+6000	+6600
2	+6000	+6600
3	+6000	+6300
4	+6000	+6300
5	+6000	+6000
6	+6000	+6000
7	+6000	+5700
8	+6000	+5700
9	+6000	+5400
10	+6000	+5400
Total net saving at end of year 10	+60000	+60000

b) Explain meaning of Demand, Explain Law of Demand and what are the assumptions of the law? (6)

Q.3 a) Explain meaning of Elasticity of Demand and what are the factors affecting on Elasticity of demand? (6)

b) i) Explain Demand Forecasting in detail. (3)

ii) Explain the factors affecting demand, its practical application and importance. (3)

Q.4 a) i) Define production and explain the factors of production. (3)

ii) Explain time value of money in detail with simple example. (3)

b) Explain concept of cost of production in detail and different types of costs. (6)

Q.5 a) Explain Market and perfect competition, monopoly, monopolistic and oligopoly market situations with their main features. (6)

b) i) Explain supply and law of supply. What is the role of demand and supply in price determination? (6)

Or

ii) What are the difference between Central bank and Commercial bank? (6)

Q.6 Explain the following. **(solve any three)** (12

i) Inflation
ii) Sensex
iii) GATT
iv) WTO
v) IMF

_____ **Paper End** _____