4E4120

Roll No. _____ Total No of Pages: 4

4E4120

B.Tech. IV-Sem (Main & Back)Exam; June-July 2016
Electrical & Electronics Engineering
4EX1A Analog Electronics
Common with EE, EX, EC, EI

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks (Main & Back): 26
Min. Passing Marks (Old Back): 24

Instructions to Candidates:-

*Attempt any **five questions**, selecting **one question** from **each unit**. All Questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.

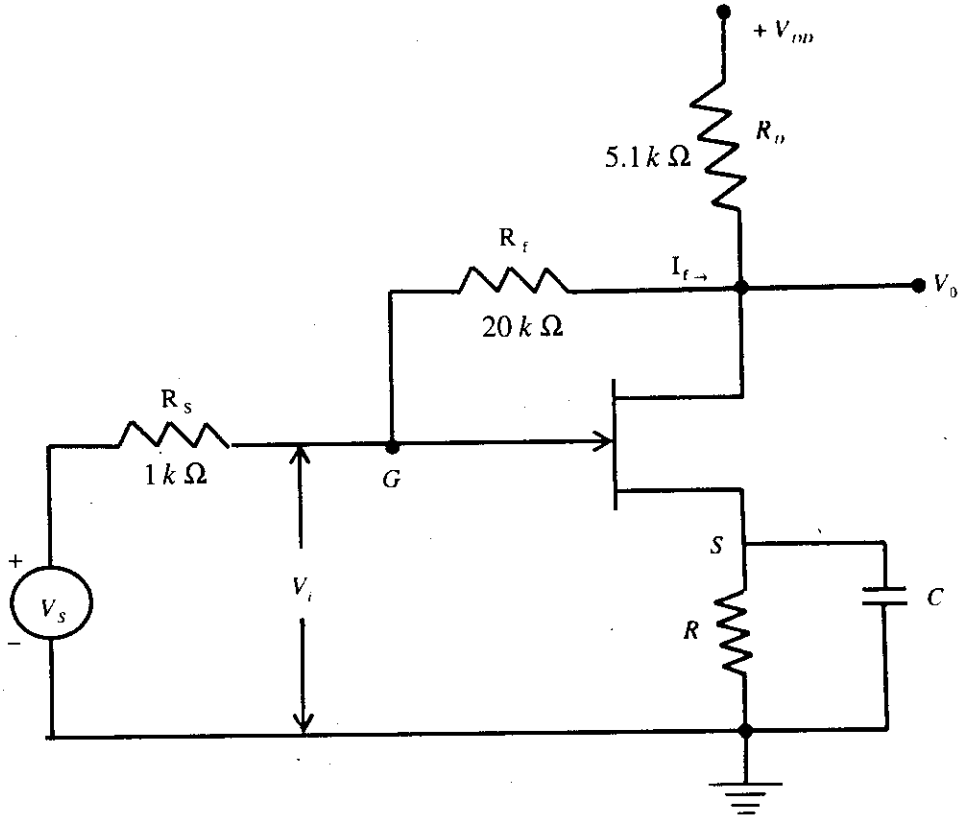
(Mentioned in form No.205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) What are the four possible topologies of a feedback amplifier? Explain with neat sketches. [8]

(b) Calculate the voltage gain with and without feedback for the circuit given in figure, with values, g_m = 5mA/V, R_D = 5.1KΩ, R_s = 1KΩ, R_f = 20KΩ, r_d = 1MΩ. [8]



OR

Q.1 (a) Sketch the circuit of a current series feed – back amplifier. Obtain the expression for the voltage gain and the input resistance of this amplifier. [8]

(b) Calculate the voltage gain, input & output resistance of a voltage series feedback amplifiers having $A_v = 300$, $R_i = 1.5K\Omega$, $R_o = 50K\Omega$ and $\beta = 1/15$. [8]

UNIT-II

Q.2 (a) Sketch the circuit for a wein bridge oscillator. What determines the frequency of Oscillators? Will oscillations take place if the bridge is balanced? [8]

(b) In a transistor colpitts oscillator has the following parameters. [8]

$L = 100\mu H$, $L_{RFC} = 0.6mH$, $C_2 = 0.001\mu F$, $C_1 = 0.01\mu F$, $C_c = 10\mu F$

Determine –

(i) Operating frequency

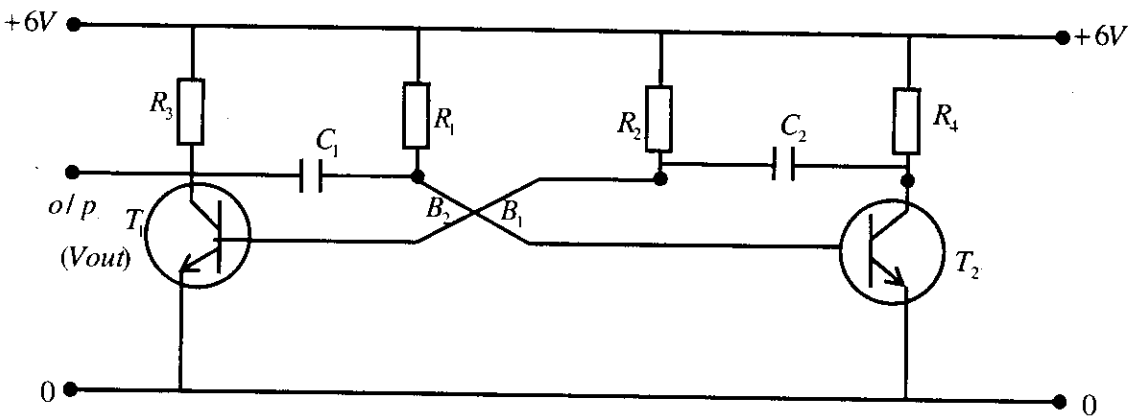
(ii) Feedback – fraction

(iii) Minimum gain to sustain oscillations and emitter resistance if $R_C = 2.5K\Omega$.

OR

Q.2 (a) What is Schmitt triggering? Explain the working of Schmitt trigger with the help of a neat circuit diagram and waveforms. [8]

(b) In a astable multi vibrator circuit diagram shown below, $R_1 = R_2 = 5K\Omega$, $R_3 = R_4 = 0.4K\Omega$ and $C_1 = C_2 = 0.02\mu F$. [8]



Determine –

(i) Time period and frequency of circuit oscillation.

(ii) Minimum value of transistor β.

UNIT-III

Q.3 (a) Draw neat diagram of hybrid - π model for a transistor at high frequency in CE configuration, discuss in brief. [10]

(b) In a hybrid π model, prove that diffusion capacitance at an emitter junction - $C_{de} = g_m W^2 / (2DB)$ where, g_m = transistor transconductance; W = base width; D_B = diffusion constant for minority in base region. [6]

OR

Q.3 (a) Write a short note on Emitter follower at high frequency and drive expression for high frequency voltage gain. [8]

(b) Given the following transistor measurement at $I_C = 5mA$, $V_{CE} = 10V$, and at room temperature. $h_{fe} = 100$, $h_{ie} = 600ohm$, $A_i = 10$ at $10MH_Z$, $C_C = 3pF$. Find F_B, F_T, C_e, $r_{b'e}$ and $r_{bb'}$. [8]

UNIT-IV

Q.4 (a) Draw the parallel resonant circuit. Obtain the expression for its band width and Q factor. [6]

(b) The single tuned amplifier circuit consists of tuned circuit having R = 50ohms, L = 10mH and C = 0.1μF. Determine the [10]

(i) Resonant frequency
(ii) Q factor of the tank circuit and
(iii) BW of the amplifier.

OR

Q.4 (a) What is stagger tuned amplifier? Explain its working with help of frequency response. [8]

(b) Draw and explain the circuit of double tuned amplifier with the help of frequency response. [8]

UNIT-V

Q.5 (a) Derive an expression for output power of class A large signal amplifier in terms of V_{max}, V_{min}, I_{max} and I_{min}. [8]

(b) What is meant by crossover distortion in class B amplifier? Explain how it is overcome in class AB operation. [8]

OR

Q.5 (a) Explain complimentary and quasi complimentary symmetry push pull power amplifier with the help of circuit diagrams. [8]

(b) A class B push – pull amplifier is supplied with $V_{CC} = 50V$. The signal swings the collector voltage down to $V_{min} = 5V$. The total dissipation in both transistors is 40W. Find the total power conversion efficiency. [8]

Determine –

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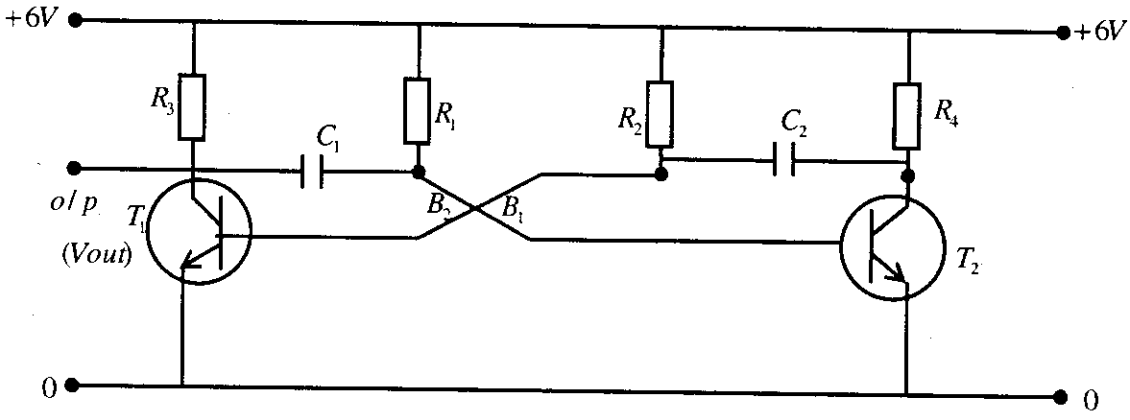

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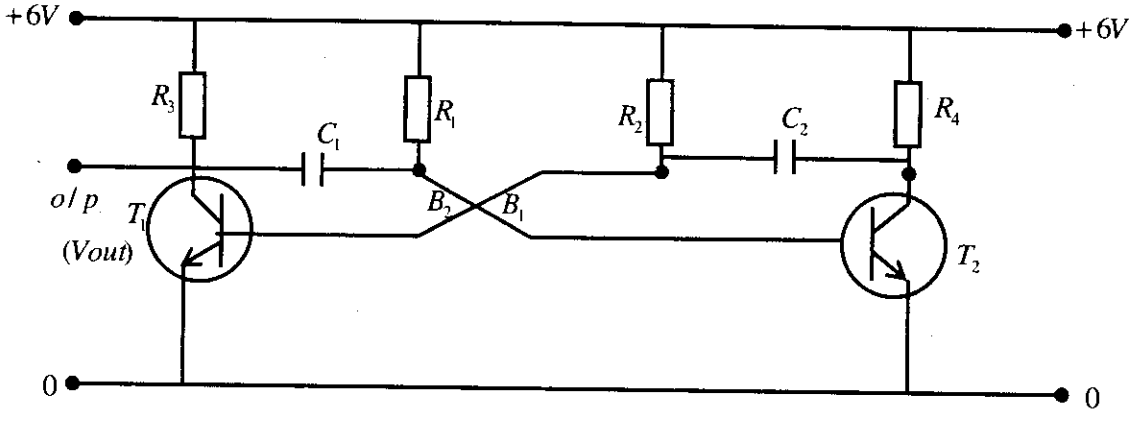

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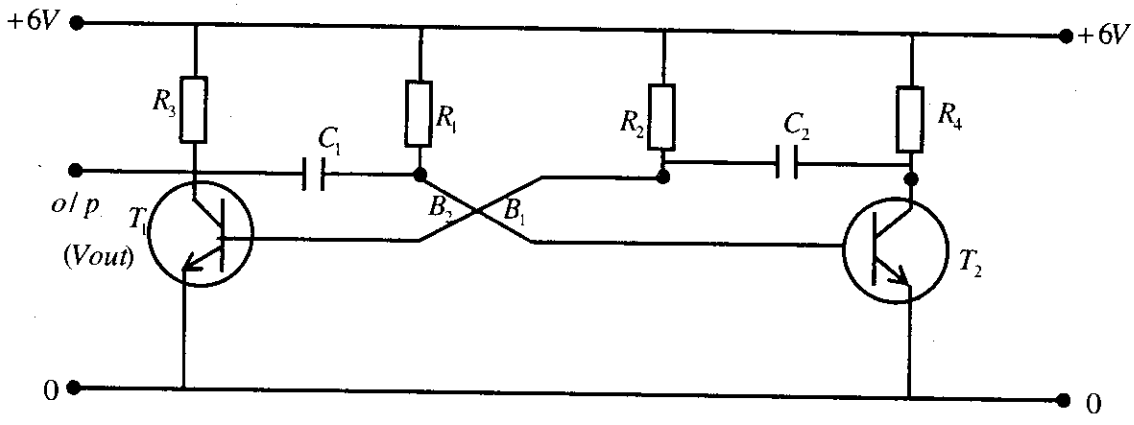

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3/1

4E4172

Roll No. _____ Total No of Pages: 7

4E4172

B.Tech. IV-Sem (Main & Back) Exam; June-July 2016

Electrical Engineering

4EE2A Circuit Analysis-II

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks (Main & Back): 26

Min. Passing Marks (Old Back): 24

Instructions to Candidates:-

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Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) Explain the Concept of Complex frequency. [6]

(b) Obtain $\frac{V(s)}{I(s)}$ and $\frac{V_{ab}(s)}{V(s)}$ for the Network shown in fig.1 [10]

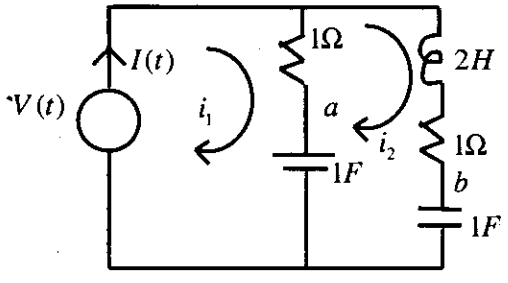

Fig.–1

OR

Q.1 (a) Determine the condition under which the input impedance of Network shown in fig.2 will be equal to R [8]

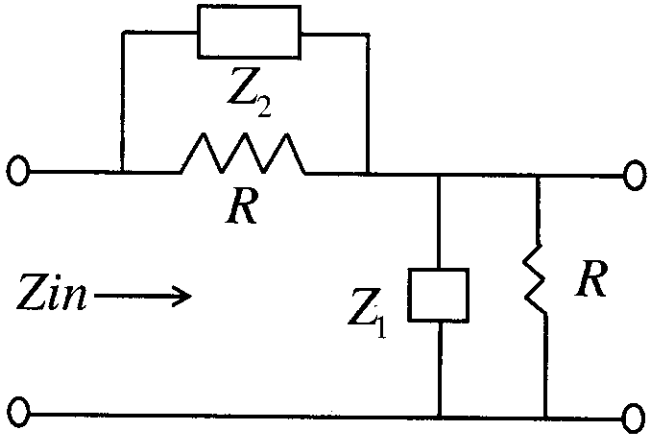

Fig.–2

(b) Find the Transform Impedance Z(s) and admittance Y(s) of the one port network shown in fig.3 [8]

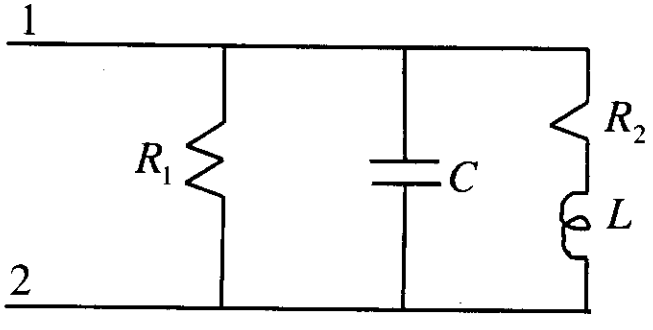

Fig.–3

UNIT-II

Q.2 (a) Write down necessary Condition for Transfer function and also find Transfer function $Z_{21}(s) = \frac{V_2(s)}{I_1(s)}$ of the Network given in fig.4 [8]

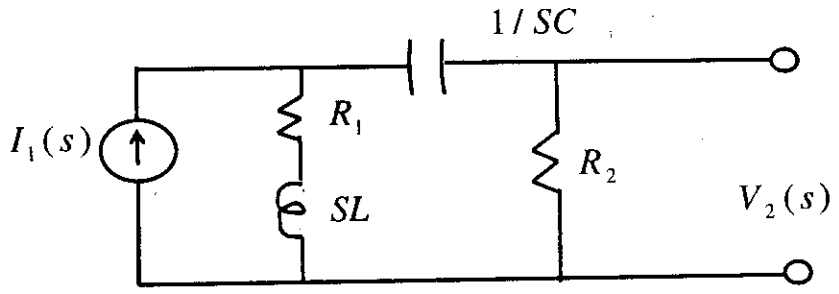

Fig . – 4

(b) For Network shown in fig.5. Compute [8]

(i) $G_{21}(s) = \frac{V_2(s)}{V_1(s)}$,

(ii) $\alpha_{21}(s) = \frac{I_2(s)}{I_1(s)}$

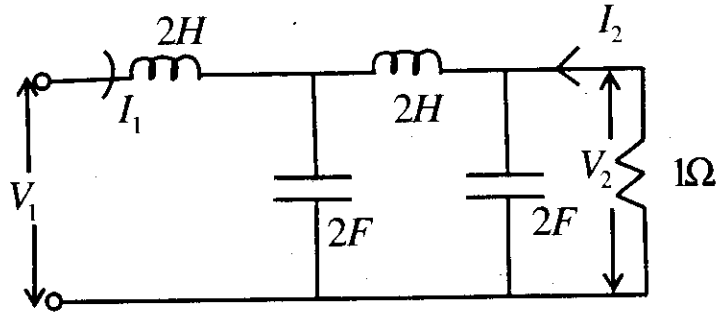

Fig.–5

OR

Q.2 (a) A series RLC circuit has for its driving point admittance pole zero diagram as shown in fig.6 find the value of R,L,C [8]

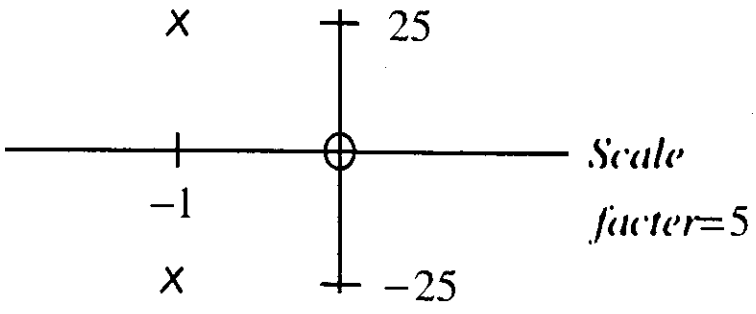

Fig.–6

(b) If Laplace transform of a voltage V (t) is

$$V(s) = \frac{4(s+1)}{(s+2)(s+3)}$$

Draw pole – zero of this function and Determine V(t) [8]

UNIT-III

Q.3 (a) Find the range of values of a so that $P(s) = S^4 + S^3 + 4S^2 + 2S + 3$ is Hurwitz. [6]

(b) Write down the property of positive real function and determine whether the function is

$$Z(s) = \frac{2s^2+5}{s(s^2+1)}$$ is P. r. or not [10]

OR

Q.3 (a) An Impedance function is given by

$$Z(s)=\frac{(s+1)(s+4)}{s(s+2)(s+5)}$$

Find R – C representation of Cauer – I and Cauer – II forms. [8]

(b) Synthesize the Impedance $Z(s)=\frac{K(s^2+1)(s^2+9)}{S(s^2+4)}$ In Foster – I and Foster – II forms if $Z(-2)=\frac{-130}{16}$ [8]

UNIT-IV

Q.4 (a) Find Z – parameters for the Network shown in fig.7 [8]

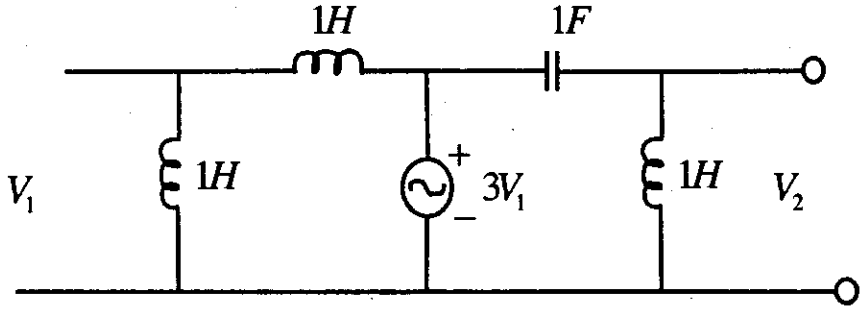

Fig.–7

(b) Define open circuit and short circuit Impedances and also calculate these Impedances in term of ABCD parameters. [8]

OR

Q.4 (a) Show that when two 2 – port Networks N_1 and N_2 are connected in parallel, the equivalent Y – parameters of the combined network is the sum of Y – parameters of each individual two – port network. [8]

(b) For the Lattice two port network of fig.8 find the Image Impedance and Image Transfer Constant. [8]

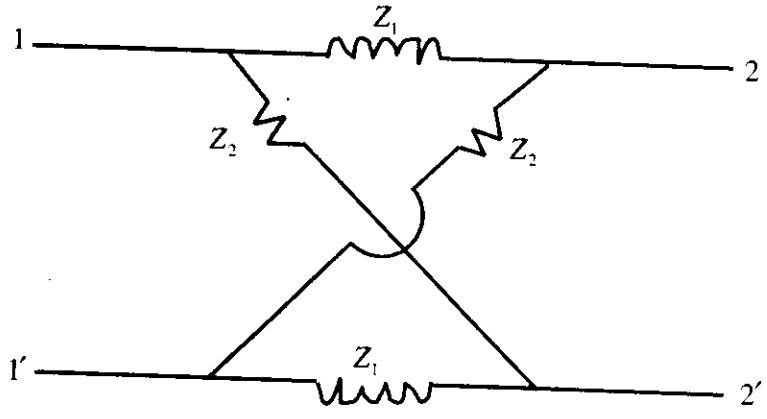

Fig.–8

UNIT-V

Q.5 (a) Design m – derived T and π section of Low Pass filter having a design Impedance 600 ohm and cut off frequency of 2000 Hz and a frequency of infinite alternation f_∞ = 2100Hz. [8]

(b) Write down short note on active filter. [8]

OR

Q.5 (a) Derive the value of characteristic Impedance for a T type constant K low pass filter. [8]

(b) Design a prototype section of band pass filter having cut off frequency of 1000Hz and 5000Hz and design Impedance of 600Ω. [8]

324

4E4122

Roll No. _____ Total No of Pages: 4

4E4122

B.Tech. IV-Sem (Main & Back) Exam; June-July 2016
Electrical & Electronics Engineering
4EX3A Electrical Measurements
Common with EE, EX, EI

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Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) Discuss the different types of errors in moving iron instruments. [8]

(b) Explain the testing and calibration of single phase energy meter by phantom loading. [8]

OR

Q.1 (a) Describe the working and constructional details of an attraction type moving iron instrument. [8]

(b) Discuss the compensation and adjustment of the errors in wattmeter. [8]

325

UNIT-II

Q.2 Draw the equivalent circuit and phasor diagram of a current transformer. Also derive the expressions for ratio and phase angle errors. [16]

OR

Q.2 (a) Discuss the measurement of power by two-wattmeter method. [8+8=16]

(b) Explain the effect of the following on the performance of current transformers.

(i) Change of primary winding current

(ii) Change of secondary circuit burden

(iii) Change of frequency

UNIT-III

Q.3 (a) Describe the basic principle of operation of d.c. potentiometer. Explain why a potentiometer does not load the voltage source whose voltage is being determined. [8]

(b) Explain the term 'standardization' of a potentiometer. Describe the procedure of standardization of a d.c. potentiometer. [8]

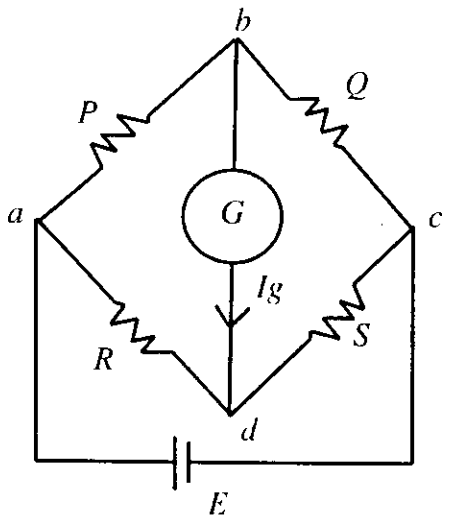
OR

Q.3 (a) Draw the circuit diagram of a Crompton's potentiometer and explain its working. Describe the steps used when measuring an unknown resistance. [8]

(b) What is a volt-ratio box? Explain its construction, Working and applications. [8]

UNIT-IV

Q.4 (a) A Wheatstone bridge is shown in figure [6]



$P = 1k\Omega$
$R = 1k\Omega$
$S = 5k\Omega$
$G = 100\,\Omega$

The thevenin source generator voltage E_0 = 24mV and the galvanometer current is 13.6 μA. Calculate the value of Q

(b) Describe the substitution method of measurement of medium resistances. List the factors on which the accuracy of the methods depends. [10]

OR

Q.4 (a) What are the different difficulties encountered in the measurement of high resistances? Explain how these difficulties are overcome. [8]

(b) What is the importance of the value of earth's resistance. What are the factors which influence its value. [8]

UNIT-V

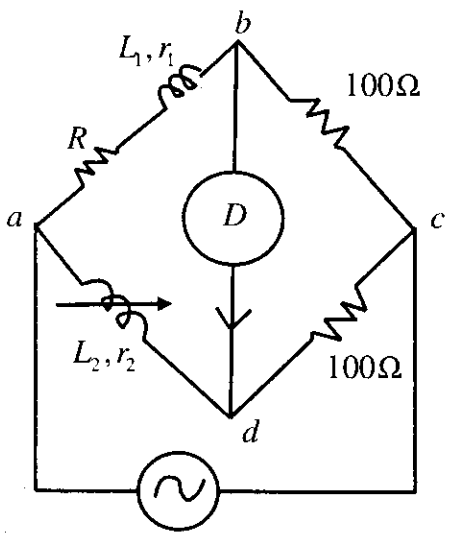
Q.5 (a) The four impedances of AC Bridge are $Z_1 = 400\angle 50°\ \Omega$; $Z_2 = 200\angle 40°\ \Omega$; $Z_3 = 800\angle -50°\ \Omega$; $Z_4 = 400\ \Omega\angle 20°\ \Omega$; here Z_1, Z_2 in one arm and Z_3, Z_4, in another arm of bridge.

Find out whether the bridge is balanced under these conditions or not. [6]

(b) Describe how an unknown capacitance can be measured with the help of D'sauty's bridge. What are the limitations of this bridge and how are they overcome. [10]

OR

Q.5 (a) A Maxwell's inductance comparison bridge is shown in figure. [6]



Arm ab consists of a coil with inductance L_1 & resistance r_1 in series with a non-inductive resistance R. Arm bc and ad are each a non- inductive resistance of 100Ω. Arm ad consists of standard variable inductor L of resistance 32.7Ω. Balance is obtained when L_2 = 47.8MH & R = 1.36Ω. Fine the resistance & inductance of the coil in arm ab.

(b) Explain how wien's bridge can be used for experimental determination of frequency. Derive the expression for frequency in terms of bridge parameters. [10]

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4E4174

Roll No. _____ Total No of Pages: 4

4E4174

B.Tech. IV-Sem (Main & Back) Exam; June-July 2016
Electrical Engineering
4EE4A Generation of Electrical Power

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1. Calculator 2. Graph paper

UNIT-I

Q.1 (a) Draw and explain an open cycle gas turbine plant with regeneration, intercooling and reheating also differentiate the open cycle & closed cycle gas turbine plant. [8]

(b) Discuss why [8]

(i) The overall station efficiency of a thermal plant is very low.

(ii) Steam Turbines have a number of stages.

(iii) Maximum thermal plants use pulverized coal.

(iv) It is necessary to heat the water before feeding it to the boiler.

OR

Q.1 (a) Explain the various types of Reactors used in nuclear power plant also explain the basic plant layout of nuclear power plant. [8]

(b) Discuss the economic feasibility of a pumped storage scheme of on hydro power plant also classified the different type of hydro electric plants. [8]

UNIT-II

Q.2 (a) Discuss the Impact of nuclear and gas power plant on environment. Also explain the green house effect. [8]

(b) Draw & explain the scheme of solar electrical energy generation also discuss the current energy scenario of India. [8]

OR

Q.2 (a) Draw & explain the scheme of Wind Power generation. Also discuss the sustainable energy system. [8]

(b) Differentiate the renewable and non – renewable energy sources. Also draw the layout of the tidal generation. [8]

UNIT-III

Q.3 (a) The load curve of an electrical system is linear with the following values at different times of the day. [8]

Time	12	5Am	9	6Pm	8Pm	10	12
Load(mw)	50	50	100	100	150	80	50

Plot chronological load curve. Find the energy required by the system in one day and the system daily load factor.

(b) Calculate the most economic power factor when

(i) When KW Demand is Constant

(ii) When KVA Demand is Constant [8]

OR

Q.3 (a) A load of 500KW at 0.8 Power factor lagging is taken by industrial concern. The tariff is ₹ 400 per KVA of maximum demand per year + 100 Paise per KWh. The cost of installation of capacitor banks is ₹ 600 per year and the Interest and depreciation is 11%. Find: [8]

(i) The most economic power factor

(ii) Rating of capacitor bank to improve the power factor to this value.

(b) Explain the following: [8]

(i) Group Diversity factor

(ii) Load factor

(iii) Utilization factor

(iv) Capacity factor

UNIT-IV

Q.4 (a) Determine the generation cost per unit of energy from the following plant data

Installed capacity = 120 MW

Capital cost of plant = ₹ 40000 per kw

Interest & deprecation = 15%

Fuel consumption = 0.64kg/ kwh

Fuel cost = ₹ 1500 per 1000kg

Salaries, wages & other operation cost per annum = ₹ 50,000,000

Peak load = 100MW

Load factor = 60%

[8]

(b) What are the different Cogeneration Technologies? Explain. [8]

OR

Q.4 (a) Explain the different method to calculate the deprecation of a plant in details. [8]

(b) Write short note on [8]

(i) Energy Conservation

(ii) Off peak energy utilization

UNIT-V

Q.5 (a) Explain the following forms of Tariff briefly [8]

(i) Flat Demand Rate

(ii) Straight meter Rate

(iii) Block meter Rate

(iv) Two Part tariff

(b) Give the comparison between thermal, hydro nuclear & gas Power Plant. [8]

OR

Q.5 (a) An Industrial consumer has single-phase 230V supply. His monthly energy consumption is 2020kwh. A maximum demand indicator installed at his premises indicates 40A which is charged at unity power factor for 2 hours daily at ₹ 3.50 per kwh. The remaining units are charged at ₹ 1.80 per kwh. Find his monthly bill (for 30 days) and average tariff per kwh. [8]

(b) What are the different factors, which governs the size and location of a Thermal Power Plant? [8]

4E4175

Roll No. _____ Total No of Pages: 4

4E4175

B.Tech. IV-Sem (Main & Back) Exam; June-July 2016
Electrical & Electronics Engineering
4EX5A Electrical Machines-II
Common with EE,EX

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks (Main & Back): 26
Min. Passing Marks (Old Back): 24

Instructions to Candidates:-

*Attempt any **five questions**, selecting **one question** from **each unit**. All Questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

1. NIL _____ 2. NIL _____

UNIT-I

Q.1 (a) Explain how rotating magnetic field is produced by three phase currents? [6+4+6=16]

(b) Explain the terms coil span factor and distribution factor in connection with three - phase armature winding, and derive the equations for

(i) Coil span factor

(ii) Distribution factor

OR

Q.1 (a) Explain what are the effects of distribution of winding and use of short- pitched coil. On the magnitude of generated voltage by ac armature winding. Write the equation of generated voltage, considering the effects of above.

(b) Find the no - load phase voltage of a star-connected, 3-phase, 6-pole alternator which runs at 1200 rpm, having flux per pole of 0.1 web Sinusoidally distributed. Its stator has 54 slots having double layer winding. Each coil has 8 turns and coil is carded by one slot. [6+10=16]

UNIT-II

Q.2 (a) What is meant by slip in an induction motor? Why must slip be present for motor action? [2+6+8=16]

(b) Derive the equation for torque of 3-plase induction motor under running condition.

(c) A 6- pole, 50Hz, 3-phase induction motor running on full load develops a useful torque of 150 N-m at a rotor frequency of 1.5 Hz. Calculate the shaft power output. If the mechanical torque lost in friction be 10 N-M, determine

(i) Rotor copper loss

(ii) The input to motor

(c) Efficiency

OR

Q.2 (a) Why starter is necessary for starting induction motors? Briefly explain with diagram, the star-delta starter. [4]

(b) Explain cogging and crawling in 3-phase induction motor. [4]

(c) Write a short note "on Induction generator" [4]

(d) Explain the method of speed control of 3-phase induction motor by varying the rotor resistance. [4]

UNIT-III

Q.3 (a) Explain the double field revolving theory of single- phase induction motor and derive the equation for net torque developed in the motor, explain why this motor is not self starting. [6]

(b) Draw and explain the equivalent circuit of single-phase induction motor based upon double field revolving theory. [5]

(c) Explain construction and principle of operation of a single-phase synchronous motor. [5]

OR

Q.3 (a) Briefly explain the construction and principle of operation of reluctance motor. Draw a typical torque speed characteristic of motor and explain. [6]

(b) 250 watt, 230 volt, 50Hz capacitor- start motor has the following constants for the main and auxiliary windings. [10]

Main winding: $Z_m = (4.5 + j\ 3.7)\ \Omega$

Auxiliary winding: $Za = (9.5 + j\ 3.5)\ \Omega$

Determine the value of capacitor that will place the main winding and auxiliary winding currents in quadrature at starting.

Where, Z_m = magnetising impedance Za = impedance of auxiliary winding.

UNIT-IV

Q.4 (a) Explain why a rotating field system is preferred in synchronous generators instead of stationary field system? [6]

(b) Explain with neat diagram, the brushless excitation system of synchronous generations. [5]

(c) Explain the Potier- triangle method of finding the voltage regulation of an alternator. [5]

OR

Q.4 (a) What is two reaction theory applicable to salient pole synchronous machines? Draw and explain the phasor diagram of salient pole synchronous machine based upon two reaction theory. [6]

(b) Show that the power developed by the salient pole synchronous machine is given by $P = \frac{E_f\ Vt}{Xd}\sin\delta + \frac{V_t^2}{2}\left[\frac{1}{Xq} - \frac{1}{Xd}\right]\sin 2.\delta$

Where Xd & Xq are direct axis and quadrature axis reactance, δ is load angle, V_t = terminal voltage and E_f = emf induced, P = power per phase. [5]

(c) What is the synchronizing power? Find the equation for synchronizing torque on no-load of a 3-phase synchronous machine. [5]

UNIT-V

Q.5 (a) Explain briefly with neat diagrams the effect of varying excitation upon armature current and power-factor of a synchronous motor when input power to motor is maintained constant. Draw V- curves and state their significance. [8]

(b) A 2300 volt, 3-phase, star connected synchronous motor has a resistance of 0.2Ω per phase and a synchronous reactance of 2.2 Ω per phase. The motor is operating at 0.5 power factor leading with a line current of 200 Amp. Determine the value of generated emf per phase. [8]

OR

Q.5 (a) Explain with neat sketches the principle of operation of a 3-phase synchronous motor. Also explain why it will not run at other than synchronous speed. [5]

(b) What is synchronous phase modifier? Explain with the help of phasor diagram its operation. [5]

(c) A 3-phase 150 KW, 2300 volt, 50 Hz, 1000 rpm salient pale synchronous motor has Xd = 32 Ω /ph, Xq = 20 Ω/ phase. Neglecting losses, calculate the power developed by the motor if field excitation is so adjusted as to make the back emf twice the applied voltage and load angle is 16°. [6]

Where: Xd = direct axis synch reactance/ phase and
Xq = quadrature synch reactance/ phase

336

4E4176

Roll No. _____ Total No of Pages: 4

4E4176

B.Tech. IV-Sem (Main & Back) Exam; June-July 2016
Electrical & Electronics Engineering
4EX6A Advanced Engg. Mathematics-II
Common with EE,EX

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks (Main & Back): 26
Min. Passing Marks (Old Back): 24

Instructions to Candidates:-

*Attempt any **five questions**, selecting **one question** from **each unit**. All Questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

1._____ 2._____

UNIT-I

Q.1 (a) Use Newton – Raphson method to find a real root of $f(x) = x^3 - 3x - 5 = 0$. [8]

(b) Given the following data:

x:	0.0	0.2	0.4	0.6	0.8
y:	0.3989	0.3910	0.3683	0.3332	0.2897

Evaluate the value of y(0.25), y(0.62) and y(0.43). [8]

OR

Q.1 (a) Fit a straight line for the following data: [8]

x:	1	2	3	4	5
y:	35	65	100	138	170

(b) Using Lagrange's interpolation formula, find the value of y(5) from the following table: [8]

x:	1	2	3	4	7
y:	2	4	8	16	128

UNIT-II

Q.2 (a) Evaluate the value of $\frac{dy}{dx}$ for x = 0.1 and 0.5 from the following table: [8]

x:	0	0.1	0.2	0.3	0.4	0.5	0.6
y:	30.28	31.43	32.98	33.54	33.97	33.48	32.13

(b) Use Runge – Kutta method to find y(1.1), given that:

$\frac{dy}{dx} = x^2 + y^2 ; y(1) = 0$ [8]

OR

Q.2 (a) Use Simpson's $\frac{1}{3}$ and $\frac{3}{8}$ rules to evaluate the integral $\int_0^1 \frac{x^2}{1+x^3} dx$. Hence obtain the approximate value of $\log_e 2$. [8]

(b) Use Milne's Predictor – Corrector method to find y(0.8), given that:

$\frac{dy}{dx} = x - y^2$; y (0) = 0, y (0.2) = 0.02, y (0.4) = 0.0795, y (0.6) = 0.1762. [8]

UNIT-III

Q.3 (a) Show that $xJ_{n+1} + xJ_{n-1} = 2nJ_n$ [8]

(b) Prove that $\int_{-1}^{1} P_m(x) P_n(x) dx = \begin{cases} 0 & ; m \neq n \\ \frac{2}{2n+1} & ; m = n \end{cases}$ [8]

OR

Q.3 (a) Show that $J_{-n}(x) = (-1)^n J_n(x), n \in Z$ [8]

(b) Show that $P_n(x) = \frac{1}{(n!)\,2^n} \frac{d^n}{dx^n} (x^2 - 1)^n$ [8]

UNIT-IV

Q.4 (a) A newly constructed house may fall down either due to wrong designing or by inferior material used in the construction. Chance that the designing is faulty is 10% and the probability of its collapse, if design is faulty is 95% and that due to bad material is 45%. If the house collapses, find the chance that it was due to wrong designing. [8]

(b) If the height of 300 students are normally distributed with mean 64.5 inches and standard deviation 3.3 inches, how many students have heights

(i) Less than 5 feet,

(ii) Between 5 feet and 5 feet 9 inches. Also find the height between which 99% of the student lie.

[(Given P $(0 < Z < 1.36) = 0.4131$, P $(0 < Z < 2.57) = 0.495$)] [8]

OR

Q.4 (a) Razor blades are supplied by a manufacturing company in packets of 10. There is a probability of 1 in 100 blades to be defective. Using Poisson distribution, calculate the number of packets containing one defective blade, no defective blade and all defective blades in a consignment of 10,000 packets. [8]

(b) The distribution of weekly wages for 500 workers in factory is approximately normal with the mean and standard deviation of ₹ 75 and ₹ 15 respectively. Find the number of workers who receive weekly wages

(i) More than ₹ 90,

(ii) Less than ₹ 45.

[(Given P $(0 \leq Z < 1) = 0.3413$, P $(0 < Z < 2) = 0.4772$)] [8]

UNIT-V

Q.5 (a) In a partially destroyed laboratory on record of an analysis of correlation data, the following results only are legible:

Var(x) = 9, Regression equations: $8x - 10y + 66 = 0$, $40x - 18y = 214$. Find

(i) The mean values of x and y,

(ii) The standard deviation of y,

(iii) The correlation coefficient of x and y. [8]

(b) Find the inverse Z – transform of following function:

$F(z) = \frac{1}{(z-1)(z-2)}$, if ROC is

(i) $|z| < 1$,

(ii) $1 < |z| < 2$,

(iii) $|z| > 2$. [8]

OR

Q.5 (a) Calculate the coefficient of correlation between x and y using the following data: [8]

x:	1	2	3	4	5	6	7	8	9
y:	9	8	10	12	11	13	14	16	15

(b) Find the Z – transform of $u_n = c^n \cosh an$, $n \geq 0$. [8]

340

4E2109

Roll No. _____ Total No of Pages: 3

4E2109

B.Tech. IV-Sem (Back) Exam; June-July 2016
Electrical Engineering
4EE1(O) Power Electronics-II

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks (Main & Back): 26

Min. Passing Marks (Old Back): 24

Instructions to Candidates:-

*Attempt any **five questions**, selecting **one question** from **each unit**. All Questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

1._____ 2._____

UNIT-I

Q.1 (a) What do you mean by feedback in amplifiers? Explain how negative feedback in an amplifier helps in reducing the distortion and noise. [8]

(b) Derive expression for output resistance is voltage series feedback amplifier. [8]

OR

Q.1 (a) Distinguish between voltage series feedback and current series. Explain briefly with suitable circuit diagram. [8]

(b) Explain the effect of negative feedback on gain and frequency response of an amp^r with the help of suitable diagram. [8]

UNIT-II

Q.2 (a) Find the operating frequency of transistor Colpitts oscillator if C_1 = 30PF, C_2 = 60PF and L = 10 μH. [8]

(b) Draw the circuit of the wein bridge oscillator. Derive the expression for frequency of oscillation for such an oscillator. [8]

OR

Q.2 (a) Explain the circuit of bistable multivibrator using n – p – n transistor and explain its working. [8]

(b) Draw the schematic diagram of Schmitt trigger and explain its working as a binary. [8]

UNIT-III

Q.3 (a) Sketch the circuit of logarithmic amplifier and explain its operation. [8]

(b) Explain the sample and hold circuit design with op – Amp. [8]

OR

Q.3 (a) Explain the reason for drift in d.c. amplifier. Show how drift is reduced in a difference amplifier. [8]

(b) Explain the following:- [8]

(i) Slew rate

(ii) Input offset voltage

(iii) Input bias current

(iv) Voltage gain.

UNIT-IV

Q.4 (a) Draw the schematic diagram of series voltage regulator and explain it. [8]

(b) Explain successive – Approximation type A to D converter using suitable diagram. [8]

OR

Q.4 (a) Compare voltage regulator and monolithic regulator. [4]

(b) Explain precision half wave rectifier. [4]

(d) Explain the operation of ramp type A to D converter using suitable diagram. [8]

UNIT-V

Q.5 (a) Explain quasi complementary symmetry amplifier. [8]

(b) Draw the diagram of a transformer coupled single – transistor output stage and explain the need for impedance matching. [8]

OR

Q.5 (a) Show that the maximum conversion efficiency of the idealized class B push pull circuit is 78.5%. [8]

(b) Explain why even harmonics are not present in a push – pull amplifier. Given two additional advantages of this circuit over that of a single transistor amplifier. [8]

343

4E2110

Roll No. _____ Total No of Pages: 3

4E2110

B.Tech. IV-Sem (Back) Exam; June-July 2016
Electrical Engineering
4EE2(O) Digital Electronics

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks (Main & Back): 26

Min. Passing Marks (Old Back): 24

Instructions to Candidates:-

*Attempt any **five questions**, selecting **one question** from **each unit**. All Questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

1._____ 2._____

UNIT-I

Q.1 (a) Convert the following into the Gray number. [9]

(i) $3A7_{16}$

(ii) 527_8

(iii) 652_{10}

(b) Perform the following decimal Subtraction in BCD by the 9's complement methods. [5]

(i) 305.5 – 168.8

(ii) 679.6 – 885.9

(c) Convert 756.603_8 to hex. [2]

OR

Q.1 (a) Perform following: [6]

(i) Multiply 1101_2 by 110_2

(ii) Divide 110101.11_2 by 101_2

(b) Convert 2598.675_{10} to hex. [3]

(c) Solve the following subtraction in XS – 3 code. [5]

(i) 267 – 175

(ii) 57.6 – 27.8

(d) Encode data bits 1101 into the 7 bit even – parity hamming code. [2]

UNIT-II

Q.2 (a) Show that (A+B) $\overline{AB}$ is equivalent to AOB. Also construct the corresponding logic diagrams. [5]

(b) Reduce the expression f = (B+BC) (B+$\overline{B}$C) (B+D) [4]

(c) Reduce using mapping the expression. [7]

f = Σ m (2, 3, 6, 7, 8, 10, 11, 13, 14)

OR

Q.2 (a) Reduce the expression f = Σ m (1, 5, 6, 12, 13, 14) + d (2,4) and implement the real minimal expression in universal logic. [12]

(b) Implement the following function using only NOR gates. [4]

f = a (b + cd) b$\overline{c}$

UNIT-III

Q.3 (a) Give the definitions of voltage and current levels corresponding to the logic 'O' and logic 'I' states, as follows: - [4]

V_{IH} (min), V_{OH} (min), V_H (max), V_{IL} (max), V_{OL} (max), I_{IH}, I_{OH}, I_{OL}

(b) Draw and explain the working of two – input TTL (NAND) Gate. What is totem–pole output? Explain its advantages and disadvantages. [12]

OR

Q.3 (a) Draw and explain the working of two input ECL OR /NOR gate. [8]

(b) Show the circuit diagram of two – input CMOS NAND gate and describe it. [8]

UNIT-IV

Q.4 (a) Implement the following function using 8 – to -1 MUX [8]

$f(x, y, z) = \Sigma m(0,2,3,5)$

(b) Sketch the logic diagram of 2 bit magnitude comparator and briefly explain its operation. [8]

OR

Q.4 (a) Design the 4 input priority encoder with truth table and draw its logic diagram. [8]

(b) Draw and explain the logic diagram of BCD adder using two 4 bit adders and a correction detection circuit. [8]

UNIT-V

Q.5 (a) Draw and explain the operation of 4 bit bidirectional shift register. [8]

(b) Write the complete steps of design of synchronous 3 bit down counter with truth tables and state diagram. [8]

OR

Q.5 (a) Convert the S – R flip flop to J – k flip flop. [8]

(b) Sketch the logic diagram of a 4 – bit controlled buffer register and briefly explain its operation. [8]

4E2112

Roll No. _____ Total No of Pages: 4

4E2112

B.Tech. IV-Sem (Back) Exam; June-July 2016
Electrical Engineering
4EE4(O) Computer Programming-II

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks (Main & Back): 26

Min. Passing Marks (Old Back): 24

Instructions to Candidates:-

*Attempt any **five questions**, selecting **one question** from **each unit**. All Questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

1._____ 2._____

UNIT-I

Q.1 Explain the following commands of Unix:- [Syntax with explanation + an example]. [2×8=16]

(a) Cat

(b) LS

(c) BC

(d) Touch

(e) Banner

(f) U limit

(g) WC

(h) Pg

OR

Q.1 Explain the following commands of Unix:- [syntax with explanation + an example]. [2×8=16]

(a) CP

(b) Who

(c) Grep

(d) Sort

(e) Cal

(f) dd

(g) du

(h) lp

UNIT-II

Q.2 Which commands are used for performing the following operations in VI editor, explain:- [2×8=16]

(a) To move up one line.

(b) To move down one line

(c) Delete a line

(d) Abandon the editor & return to shell

(e) Undo the last command

(f) Screen Scrolling

(g) Deleting & changing Text

(h) Moving Block

OR

Q.2 Which commands are used for performing the following operations in VI editor, explain:- [2×8=16]

(a) String replacement

(b) Display terminal setting

(c) Break a line if it is two long

(d) Shifting a block of code in left

(e) Spell checking

(f) Page break

(g) Delete all comment lines

(h) Double spacing between lines

UNIT-III

Q.3 (a) How JAVA is different from C++? List the advantages of JAVA in comparison with C++? [8]

(b) What are the various data types used in JAVA? Explain in brief. [8]

OR

Q.3 (a) Write short notes on:- [2×4=8]

(i) JAVA byte code

(ii) JAVA Virtual machine

(b) What are applets in JAVA? How they are used? What are their advantages? [8]

UNIT-IV

Q.4 (a) Explain Bitwise & Bit shift operators in JAVA using suitable examples. [8]

(b) What are the various branching statements supported by JAVA. Give appropriate examples also. [8]

OR

Q.4 (a) Explain Equality, Relational and conditional operators in JAVA using suitable examples. [8]

(b) Explain the while and do – while statements in JAVA using a program. Differentiate between these two statements. [8]

UNIT-V

Q.5 (a) What are packages? How they are defined in JAVA. Explain using an example importing a JAVA Package. [8]

(b) How interfaces are defined and implemented in JAVA. [8]

OR

Q.5 Write short notes on the followings: - [4×4=16]

(a) Applets in JAVA

(b) Awt tools & controls

(c) Mouse & keyboard interfaces

(d) String handling
