467

4E2109

Total No. of Questions: 5 OR 5

Total No. of Pages: 3

Roll No. _____

B.Tech. IV Semester (Old Back) Exam., July 2014
Electrical Engg.
4EE1 Power Electroncis II

[redacted] 4E2109

Time: 3Hours

Maximum Marks: 80
Min Passing Marks: 24

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) Find the R_{if} , R_{0f} and A_{if} in a voltage series feedback amplifier whose $R_i = R_0 = 10\ k\Omega$ and open loop gain = 500. Assume feedback is 90 %. 12

b) Write two advantages of positive feedback. 4

12+4=16

OR

Q.1 a) Write complete analysis of a current shunt feedback amplifier.
b) State stability criterion and explain its conditions.

8+8=16

UNIT -II

Q. 2 a) Design a *LC* oscillator with Hartley configuration for oscillation frequency $f_0 = 2MHz$.
b) Draw a stable multivibrator with 30% duty cycle.

8+8=16

P.T.O.

OR

Q.2 a) Draw circuit diagram of a Schmitt trigger, also draw its o/p waveform and transfer characteristic.
b) What is crystal oscillator? Draw its electrical equivalent circuit and reactance variation with frequency.

8+8=16

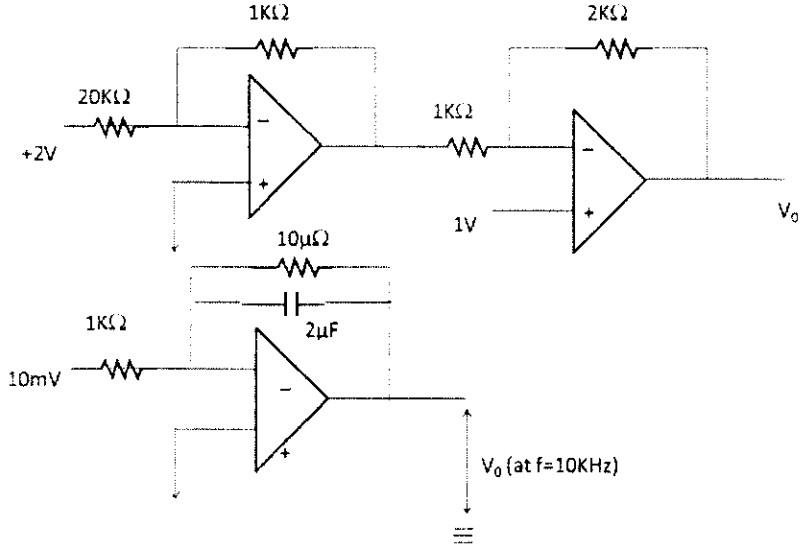
UNIT -III

Q. 3 a) Draw following circuit diagram.
i) Practical integrator
ii) Analog multiplier
iii) Differntial DC amplifier
iv) Comparator

4x4=16

OR

Q.3 a) Find the O/P voltage in Fig-3



8+2=16

UNIT -IV

Q. 4 a) Draw the circuit diagram of
i) Shunt voltage regulator
ii) Peak defector

8x2=16

OR

Q.4 a) Explain and draw following circuit diagram.
i) A to D convertor
ii) IC 555 timer

8x2=10

UNIT -V

Q. 5 a) Find the collector efficiency of Class-A Amplifier.
b) Draw pushpull Amplifier that can remove Harmonic distortion. 8+8=16

OR

Q.5 a) What is class AB Amplifier and find its conversion efficiency. 8
b) What is Transformer coupling? How the conversion efficiency changes in this coupling? 8

8+8=16

Q.4 a) Design a 32- to -1 MUX using 8- to-1 MUX having an active low enable input and 2 - to-4 decoder. 8

b) Design a BCD ADDER circuit capable of adding BCD equivalent of two - digit decimal numbers, if the design has to be TTL family compatible 8

8+8=16

UNIT-V

Q.5. a) Briefly explain, why the maximum usable clock frequency of a ripple counter decrease as more flip-flops are added to counter to inercase its MOD-Number. 8

h) With the help of a suitable circuits, briefly explain how a D-flip-flap can be use to detect the sequence of occurrence of edges of synchronous inputs. 8

OR

Q.5. a) The 100KHz square wave of fig 5, is applied to the clock input of the flip-flop shown in fig 5(i) & fig. 5(ii). If the Q output is initially '0', then draw the Q output waveform in the two cases. Also determine the frequency of Q out put in two cases. 10

h) Discuss the differences between the coccating sequence of:

i) a four-bit binary UP counter and a four-bit binary DOWN counter.

ii) a four-bit ring counter and a four-bit Johnson Counter. 6

4E2110

Total No. of Questions: Total No. of Pages:

Roll No. _____

B.Tech. IV Semester (Old Back) Exam., July 2014
Electrical Engg.
4EE2 Digital Electronis
4E2110

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

Min Passing Marks: 24

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.

UNIT -I

Q. 1 a) Perform the follnwing nperation using binary floating point numbers:

i) Subtract $(17)_8$ from $(21)_8$

ii) Add $(1E)_{16}$ and $(F3)_{16}$

iii) $(E3B)_{16}$ divided by $(1A)_{16}$ 6

b) A 16-bit data word given by 1001100001110110 is to be transmitted by using a four fnld repetition,. If the data word is broken into four blocks uf four bits each. then write the transmitted bit stream using Hanning codes. 6

c) The result nf adding two BCD numbers represented in excess-3 code is 01111011, when the two numbers are added using simple binary addition. If one of the numbers is$(12)_{10}$, find the other number. 4

OR

Q.1 a) Prove that 16-hit 2's complement arithmetic carrot be used to add +18150 and +14618, while it can be used to add -18150 and -14618. 6

b) By writing the parity ende(even) and three fold repetitinn code for all possible four-bit straight binary numbers, prnve that the Hamming distance in the above cases is , atleast 2 in the case of parity code and 3 in the case of repetition code. 10

UNIT -II

Q. 2 a) Draw logic diagram to implement an Eight input Ex-NOR function using the minimum number of 2-input logic gates.

b) Simplify the Boolean function given by:

$f(A,B,C) = (A+B+C).(\bar{A}+B+\bar{C}).(A+\bar{B}+C)$ for the don't care enndition expressed as $(\bar{A}+\bar{B}).(\bar{A}+B=C)$ 8

OR

Q.2 a) Simplify the following Boolean functions using Quine-Mc Clusnky method:.

(i) f(A.B.C.D.E.F G) = $\sum$ (20,21,28 29,52,53,60,61)
(ii) f(A.B.C.D) =$\sum$(1,2,3,9,12,13,14 + d(0,7,10,15)
b) Perform the following operations: 6
i) Dual of $ABC\bar{D} + A\bar{B}\bar{C}D + \bar{A}\bar{B}\bar{C}\bar{D}$
ii) Complement of $A + [(B + \bar{C}).0 + \bar{E}] - F$

Unit- III

Q.3 a) Why ECl is called non-saturating logic? What is the main advantage accruing from this? With the help of relevant circuit, briefly describe the operation of ECL OR/NOR logic. 8
b) With help of suitable schematics, briefly describe the interface of TTL-to CMOS and CMOs-to-TTL. 8
8+8 = 16

OR

Q.3 a) How many inputs of low-power schotty TTL NAND can be reliability driver from a single output of schottky TTL NAND. Given the following relevant specifications for the devices of two TTL sub-fanilies:
Schottky TTL : I_{OH} = 1mA ; I_{IH} = 0.05mA
I_{o2} = 20mA : I_{IL} = 2mA
Low poer schotky TTL : I_{OH} = 0.4 mA ; I_{IH} = 0.02mA
I_{o2} = 8mA : I_{IL} = 0.4 mA 4

b) Why it is not recommended to leave unused logic inputs floating? What should be done to such inputs in the case of TTL and CMOS logic gates. 4
c) With the help of suitable Schematics, briefly describe the interface of TTL to ECL and ECl to TTL. 8

UNIT -IV

Q. 4 a) Briefly describe the concept of look-a-head carry generation with repect to its use in adder circuit. What is its significance while implementing hardware for addition of binary numbers of longer length. 4
b) Design an eight-bid ADDER-SUBSTRACTOR circuit using four-bit binary ADDER and two-input EX-OR gates. 8
c) Determine the number of half and full ADDER Circuit blocks required to construct a 64—bit binary parallel ADDER. Also, determine the number and type of additional logic gates needed to transform this 64-bit ADDER into a 64-bit ADDER-SUBSTRACTOR. 4
4+8+4=16

OR

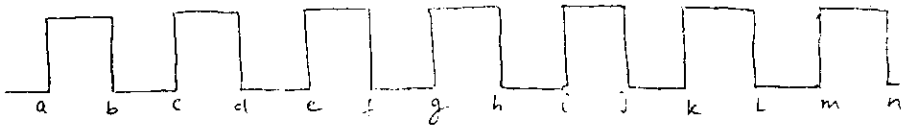


Figure 5

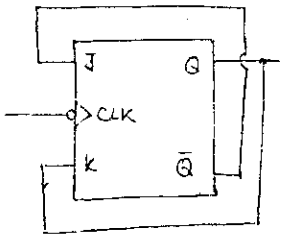


Figure 5(i)

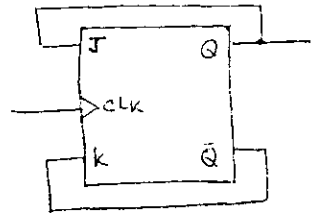


Figure 5(ii)

Figures for Problem 5(a)

4E2111

B.Tech. IV Semester Back Exam., July 2014
Electrical Engg.
4EE3 Electrical Machines-II
4E2111

Time: 3Hours **Maximum Marks: 80**
Min Passing Marks: 24

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.

UNIT -I

Q. 1 a) Explain clearly the meaning of distribution factor and coil-span factor. Give expressions for them. 8

b) Derive e.m.f. equation for an alternator. Explain the effect of distribution of winding on the magnitude of the generated voltage. 8

OR

Q.1 a) Explain how rotating magnetic fields are produced by three phase currents.
b) state how the direction of rotation of a rotating magnetic field may be changed.
c) A 3-phase, 6-pole, star-connected alternator revolves at 1000 r.p.m.. The stator has 90 slots and 8 conductors per slot. The flure per pole is 0.05 Wb (sinusoidally distributed). Calculate the phase and line induced voltages by the machines if the winding factor is 0.96.

5+3+8=16

UNIT -II

Q. 2 a) How are the conditions of cogging and crawling produced in 3-ϕ induction motor? How are these conditions avoided? 8

b) A6-pole, 3-phase, 50Hz. Induction motor develops a maximum torque of 30Nm at 960 r.p.m. Determine the torque exerted by the motor at 5% slip. The rotor resistance per phase is 0.6 Ω. 8

OR

Q.2 a) Derive the relationship for torque developed by a 3-phase induction motor. Draw a typical torque-slip characteristic and deduce the condition for maximum torque. 8

b) write short note on double cage induction motor. 8

UNIT -III

Q. 3 a) Why starters are necessary for starting of induction motors. Explain star-delta method of starting in detail. 8
b) Write in brief the speed control methods of induction motor and discuss in detail cascade speed control method. 8

OR

Q.3 a) How single phase induction motor can be made self started? Explain any two methods. 8
b) Explain the double revolving field theory. 8

UNIT -IV

Q. 4 a) Define the terms synchronous reactance and voltage regulation of an alternator.
b) Explain the various factors, which may effect the regulation of an alternator. 8
c) Explain how open-circuit and short-circuit tests are conducted on synchronous machine. 8

OR

Q.4 a) Two three-phase alternators operate in parallel. The rating of one machine is 50Mw and that of other is 100 Mw. Both alternators are fitted with governors having a droop of 4 percent. How will the machines share a common load of 100 MW. 8
b) Write short note on hunting and its prevention. 8

UNIT -V

Q. 5 a) Explain with neat sketches, the principle of operations of a3-phase synchronous motor. Also explain, why it will not run at other than synchronous speed. 8
b) Explain the effect of varying excitation on armature current and power factor in synchronous motor. Draw V-curves and state their significance. 8

OR

Q.5 a) What is synchronous condenser? Explain with the help of phasor diagrams, its operation. What are its applications? 8
b) The full-load current of a3.3 kv, star-connected synchronous motor is 160 A at 0.8 pf. Lagging. The resistance and synchronous reactance of the motor care 0.8 ohm and 5.5 ohm per phase respectively. Calculate the excitation emf., torque angle, efficiency and shaft output of the motor. Assume the mechanical stray load loss to be 30 kw. 8

4E2112

Total No. of Questions: Total No. of Pages:

Roll No. _____

B.Tech. IV Semester (Old Back) Exam., July 2014
Electrical Engg.
4EE4 Computer Programming
4E2112

Time: 3Hours **Maximum Marks: 80**
Min Passing Marks: 24

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 Describe the following UNIX Commands.
a) Cat and PWD b) passwd and grep
c) Compress and lp d) sort and fee
4x4=16

OR

Q.1 a) what are the following permissions assigned to files in UNIX? How can you change the permissions for a file. Explain with examples. How do you mark file permissions.
b) how hidden files is specified in UNIX? How would you display a hidden file in directory listing using is.
8+8=16

UNIT -II

Q. 2 a) What are different modes in which VI editor works. 8
b) How would you perform the following operations in VI editor.
i) Undo last editing instruction
ii) How to join two lines
iii) Delete next 6 lines
iv) Delete one word from the current cursor position
4x2=8

OR

Q.2 a) Explain the set commands. 8

b) There are three files available. How would you replace all occurrences of the word 'student' with word "STUDENT". 8

8+8=16

UNIT -III

Q. 3 a) Write short notes on the following

i) Java virtual machine

ii) Operator available in Java 4x2=8

b) What do you mean by 'recursion'? Does Java supports Recursion? Write a recursive Java program to find the fractional of 7. 2+2+4=8

OR

Q.3 a) Explain the use of 'Final' keyword as it applies to instance variables, methods and classes. 8

b) Explain the use of super keyword as it applies to inheritance. Explain 'static' keyword in Java. 8

8+8=16

UNIT -IV

Q. 4 a) Explain various bitwise shift operations available in Java with illustrative examples. 8

b) Write a Java program to determine sum of the following harmonic series for a given value of n.

$$1+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\text{- - - - - - - - - - }+\frac{1}{n}$$

The value of n should be given interactively through the keyboard. 8

OR

Q.4 a) Explain switch and loop statements with the help of examples. 8

b) Write a Java program to read a string and check whether string is palindrome or not. 8

UNIT -V

Q. 5 a) Describe applet architecture by describing different methods used in applets.

b) Explain the function of 'import statement'. Can you write a compiete java program without using any import statement, justify. 8+8=16

OR

Q.5 a) Explain various categories of visibility of class members with reference to various specifiers that arises as a result of 'package' concept.

b) Write short note on defining and implementing interface. 8+8=16

4E2113

Total No. of Questions: Total No. of Pages:

Roll No. _____

B.Tech. IV Sem. (Back) Exam July 2014
Electrical engg.
4EE5 Curcuit Analysis-II
4E2113

Time: 3Hours **Maximum Marks: 80**
Min Passing Marks: 24

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) In the network of fig:1, find pole zero plot. 8

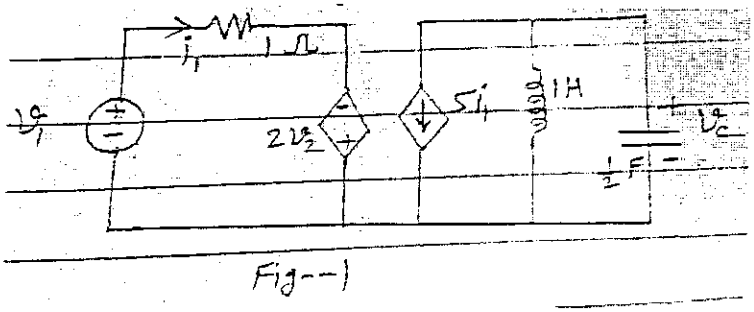
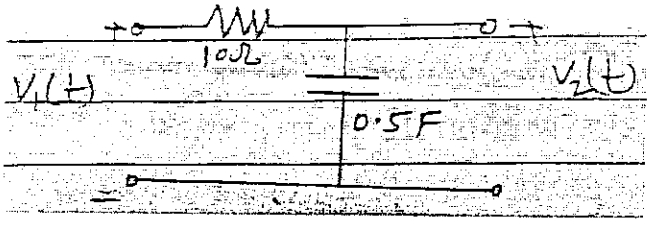


Fig--1

b) Obtain the transfer function $\frac{V_2(\delta)}{V_1(\delta)}$ of the network shown in fig. 2
Find $V_2(t)$ when $V_1(t) = 10e^{-2t}V$

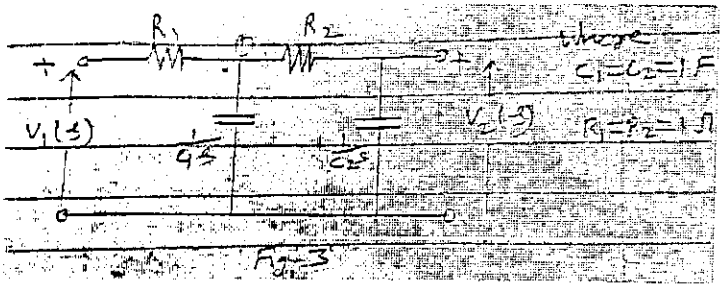


OR

Q.1 a) Obtain the pole-zero diagram f the given function and obtain time domain response.

$$I_s = \frac{2s}{(s+1)(s^2+2s+4)}$$

b) Find $G_{21}(s)$ for the network in fig:3 when $V_1(s)$ is the applied voltage at the input terminals.



UNIT -II

Q. 2 a) Test whether the given function is Hurwitz or not.

$$P(s) = s^5 + 3s^4 + 4s^2 + s + 1$$

8

b) Check the positive realness of the function

$$P(s) = \frac{s^2 + s + 4}{s^2 + s + 1}$$

OR

Q.2 a) Find the faster second form of the driving point impedance function

$$Z(s) = \frac{2s^5 + 10s^3 + 10s}{s^4 + 4s^5 + 3}$$

In the CAUER first form.

UNIT -III

Q. 3 a) Obtain Y-parameter of the network shown in fig.4

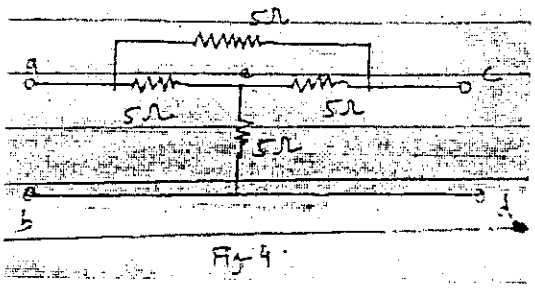


Fig 4

b) Express ABCD parameters in term of h-parameters.

8+8

OR

Q.3 a) The currents I_1 & I_2 at input and output port respectively of two-port network can be expressed as

$$I_1 = 5V_1 - V_2$$
$$I_2 = -V_1 + V_2$$

i) Find equivalent Π- network

ii) Find the input impedance when a load of (3+i5) ohms is connected across the output pool. 8

b) Find Z-parameters of the circuit shown in fig 5

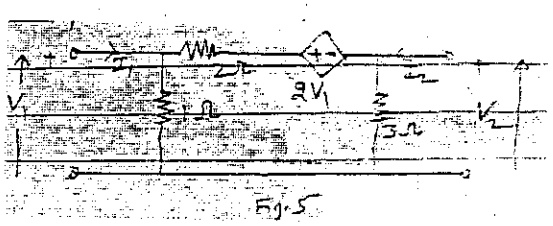


Fig 5

UNIT -IV

Q. 4 a) Design an m-derived low pass filter(T and Π section) having design resistance $R_0 = 500\ \Omega$, Cut-off frequency fc=1500 Hz and infinite attenuation frequency fx = 2000Hz.

b) In a series LCR type BPF, L= 50mh, C=127 nF and R_F = 63ohms. Determine (i) resonance frequency (ii) the bandwidth (iii) cut-off frequency. Assume the load resistance to be 600 ohms. 10+6

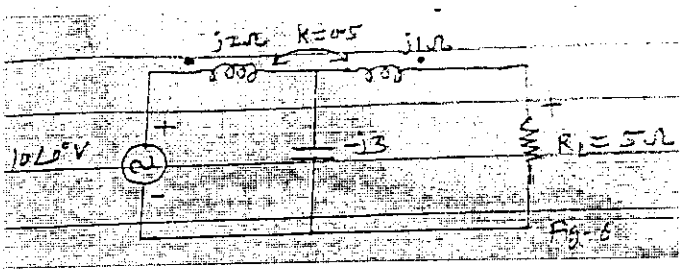
OR

Q.4 a) A prototype "High Pass Filter" with L=4.77 mH and C= 0.01326 MF has a Cut-off frequency of 10 KHz and design impedance of 600 Ω . Design a suitable terminating half section with m=0.6 such as to operate with same cut-off frequency. 8

b) Design an m-derived T-section low pass filter having cut-off frequency (Fc)= 7 KHz, design impedance $R_0 = 600\ \Omega$ and frequency of infinite attenuations Fx = 10.5 KHz.

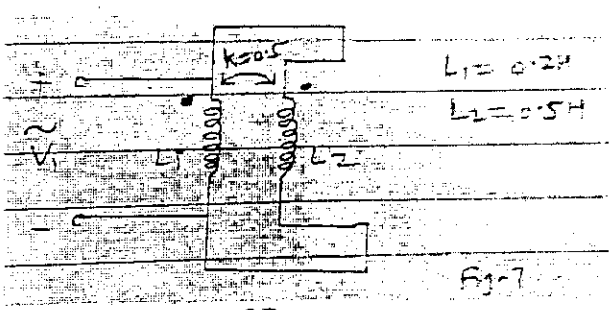
UNIT -V

Q. 5 a) Find the drop across R_L in fig. 6



8

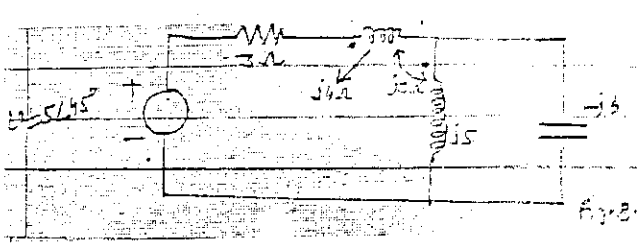
b) In the coupled circuit of fig. 7, find the input impedance as well as the nef inductance.



OR

Q.5 a) For an ideal transformer, show that $\frac{V_1}{V_2} = \sqrt{\frac{L_1}{L_2}}$ Where L_1 & L_2 are the self inductances of the primary and secondary windings.

b) Find the drop across the capacitor & the resistor in Fig. 8



480

4E2114

Total No. of Questions: Total No. of Pages:

Roll No. _____

B.Tech IV sem(Old Back) Examination July 2014
Electrical Engg.
4EE6.1 Advance Mathematics
4E2114

Time: 3Hours **Maximum Marks: 80**
Min Passing Marks: 24

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) Find the real root of the equation $x^3 - x^2 - 2 = 0$, correct to three decimal places by Regula False method. 4

b) Find $f_{(x)}$ by lagrang's Interpolation from the following data

x	0	1	2	3	4
f_x	0	16	48	88	0

6

c) Use strilng formula to obtain $f_{(32)}$ for given data

x	20	25	30	35	40	45
f_x	14.035	13.674	13.257	12.734	12.089	11.309

6

OR

Q.1 a) Find by Newton-Raphson method a root of equation $x^3 - 3x - 5 = 0$. 6

b) From the following given data

X	0.10	0.15	0.20	0.25	0.30
y	0.1003	01511	0.2026	0.2554	0.3093

Use suitable interpolation formula to calculate y for
(i) X = 0.28 (ii) x = 0.12

c) By the method of least squares, find the straight line that best fits the following data

X	1	2	3	4	5
y	14	27	40	55	68

UNIT -II

Q. 2 a) Evaluate $\int_0^1 \frac{1}{1+x^2}dx$

By using

(i) Trapazlodal rule

(ii) Simpson's 1/3 rd rule

(iii) Simpson's 3/8th rule

Hence obtain value of π in each case.

8

b) Using Milne's method to find $y(0.8) from \frac{d_y}{d_x} = 1 + y^2, y(0) = 0$ given that $y(0.2) = 0.2027, y(0.4) = 0.4228$ and $y\,(0.6) = 0.6841$

OR

Q.2 a) Use Runga-Kutta method to solve

$\frac{d_y}{d_x} = x + y$, given that

Y=1 when x=0 for x =0.2 taking one step of h=0.2

8

b) Using modified Euler's method numerically solve the equation

$$\frac{d_y}{d_x} = x + y$$

With initial condition y= 1 and x = 0 for the range $0 \leq x \leq 4$ in step of 0.2 check your result with exact values.

UNIT -III

Q. 3 a) Show that

(i) $(2n+1)x\,P_n(x) = (n+1)P_{n+1}(x) + nP_{n-1}(x)$

(ii) $nP_n(x) = xP_n{}^1(x) - P^1(x) - P^1{}_{n-1}(x)$

4+4=8

OR

Q.3 a) Show that

i) $\frac{d}{dx}[x^n J_n(x)] = x^n J_{n-1}(x), n \geq 0$

ii) $\frac{d}{dx}[x^{-n}J_n(x)] = -x^{-n}J_{n+1}(x), n \geq 0$

4+4=8

b) State and prove Rogrigue's formula for Legendre's Plynomial.

UNIT -IV

Q. 4 a) State and prove Baye's theorm. 6

b) A card is draw form a pack of 52 cards. If the value of face cards is 10, are cards is 1 and others according to denomination . Find the expected value of the number of points on the card. 4

c) If skills are classified as A, B,C according as the length, breadth index is under 75, between 75 and 80, over 80. Find approximately (assuming that the distribution is normal) the mean and standard deviation of a series in which A are 58%, B are 38% and C are 4 % being given that if

$$f_x = \frac{1}{\sqrt{2\pi}} \int_0^z e^{\frac{t^2}{2}}\, dt, then$$

$$f(0.20) = 0.08, f(1.75) = 0.46$$

OR

Q.4 a) In a certain factory turning out razar blades, there is a small chance 1/I00 for any blades to be defective. The blades are supplied in packet of 10. Use the poisson distribution to calculate the approximate number of packets containing (i) no defective (ii) one defective (iii) two defective blades respectively in consignment of 10,000 packets.(Given that $e^{-0.1} = 0.9048$)

8

b) From a lot of 25 items containing 5 defectives, a sample of 4 items is drawn at random (i) without replacement (ii) with replacement. Find the expected value of the number of defectives in the sample in each case. 8

8+8=16

UNIT -V

Q. 5 a) In a partially destroyed laboratory record of an analysis of a correlation data, the following result only are eligible variance of x = 9, regression equations are $8x - 10y + 66 = 0, 40x - 18y = 214$

What are

(i) The mean values of x and y

(ii) The coefficient of correlation between x and y

(iii) The standard deviation of y.

8

b) Ten competitors in a beauty contest got marks by three judges in the following orders:

First Judge	1	6	5	10	3	2	4	9	7	8
Second Judge	3	5	8	4	7	10	2	1	6	9
Third Judge	6	4	9	8	1	2	3	10	5	7

Use the rank correlation to discuss which pair of judges have the nearest approach to common taste in beauty. 8

8+8=16

OR

Q.5 a) Use Z-transform to solve the difference equation

$u_{n+2} + 6u_{n+1} + 9u_n = Z^n;$

$u_0 = u_1 = 0$ 8

b) (i) Find Z-transform of u_n and show the region of convergence, where

$$u_n = \begin{cases} 5^n; & n < 0 \\ 3^n; & n \geq 0 \end{cases}$$

Find Z- transform of $\{a^n \sin n\theta\}$ and $\{a^n \cos n\theta\}$ for $n \geq 0$

4+4=8

8+8=16