

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-1080
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y B.Tech. (ETC) CBC & Grading System (Sem IV)
High Speed Analog Devices
[Revised]

[Time: Three Hours]

[Max.Marks:80]

N.B

Please check whether you have got the right question paper.

- i) Q.No.1 and Q.No.6 are compulsory.
- ii) Attempt any two questions from the remaining section A & B separately.
- iii) Figures to the right indicate full marks.

Section A

- | | | |
|-----|---|----------|
| Q.1 | Solve | 10 |
| | <ul style="list-style-type: none"> a) What is bandwidth limitation? b) Enlist OP-Amp parameters? c) Draw Half wave precision rectifier? d) What is frequency synthesizer? e) Draw summing & difference Amplifier circuit. | |
| Q.2 | <ul style="list-style-type: none"> a) For instrumentation Amplifier explain the method of nulling mode output and how DC output voltage can be level shifted? b) Explain AD 847 with its pin diagram. ESD susceptibility and draw circuit for its Non Inverting Configuration? | 08
07 |
| Q.3 | <ul style="list-style-type: none"> a) Compare AM & FM detector. b) Explain any one current feed back amplifier family IC? | 08
07 |
| Q.4 | <ul style="list-style-type: none"> a) Derive output voltage equation of 3 input Non inverting summing circuit and show that how it can be converting in to summing circuit. b) Define CMRR for OP Amp. A 741 op am is used in Non Inverting amplifier with a voltage gain of 50. Calculate typical output voltage that would result from common mode input with peak level of 100 mv? | 08
07 |
| Q.5 | <ul style="list-style-type: none"> a) Explain comparator LM 339? b) Explain sample & Hold Circuit using OP Amp? | 08
07 |

Section B

- | | | |
|-----|---|----|
| Q.6 | Solve | 10 |
| | <ul style="list-style-type: none"> a) Write ADC applications in ultrasound. b) Pin information & pin diagram of IC AD 847. c) What is mean by Pipeline ADC? d) List down the unique features of HEMT. e) What are the advantages of folded cascade topology? | |

- | | | |
|------|--|----|
| Q.7 | a) What are the requirements of high speed devices, circuits & its material? | 08 |
| | b) Explain high performance video line drivers? | 07 |
| Q.8 | a) Explain high speed ADC application in software Radios? | 07 |
| | b) Explain the aspects of Cable Line drivers and receivers? | 08 |
| Q.9 | a) Explain in details the Differential line drivers & receivers? | 08 |
| | b) Compare dHEMT & eHEMT? | 07 |
| Q.10 | a) Compare VFB & CFB OP Amp? | 08 |
| | b) Draw & explain circuit of high speed clamping amplifier? | 07 |

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-1127
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y. B.Tech. (ETC) (Sem-IV)
Power Devices & Machines
[Old]

[Time: Three Hours]**[Max.Marks:80]**

- N.B Please check whether you have got the right question paper.
- (i) Question No.1 from Section A and Question No. 6 from Section B are compulsory.
 - (ii) Solve any two from remaining questions from each Section.
 - (iii) Assume suitable data, if required.

SECTION - A

- Q.1 Attempt the following: 10
- a) Define Latching and Holding current.
 - b) What are the voltage and current rating of Power BJT?
 - c) Compare TRIAC and DIAC.
 - d) Define Commutation.
 - e) What are the applications of chopper?
- Q.2 a) Explain class C commutation with neat circuit diagram and waveform associated with it. 08
- b) Explain Reverse Recovery characteristics of power diode with neat waveforms. 07
- Q.3 a) Describe the basic structure and VI characteristics of SCR. 08
- b) Explain Turn ON and Turn OFF methods of SCR. 07
- Q.4 a) Explain basic principle of operation of cycloconverter with its circuit diagram and waveforms. 08
- b) Explain basic principle of operation of step down chopper with its circuit diagram and waveforms. 07
- Q.5 a) Explain operation three phase bridge inverter in 120 degree mode. 07
- b) A single phase half wave converter is operated from 230 V, 50 Hz source and the load resistance is $R = 15 \text{ ohm}$. For a firing angle delay of 30 degree, determine: 08
- (i) Rectification efficiency, (ii) Form factor
 - (iii) Voltage ripple factor, (iv) TUF and PIV of Thyristor.

SECTION - B

- Q.6 Attempt the following: 10
- a) Why armature and pole shoes are laminated in DC machine?
 - b) What is the role of commutator in DC machine?
 - c) Elaborate the power flow in induction motor.
 - d) Draw a neat labelled circuit of capacitor start single phase induction motor.
 - e) What is universal motor? State any two applications of it.

- Q.7 a) Explain the operating principle of a simple loop dc generator with neat sketch and derive its EMF equation. 08
b) Draw & explain the operating characteristics of DC shunt motor. 07
- Q.8 a) A 3 phase, 15 hp, 460 V, 4-pole, 60 Hz, 1728 rpm induction motor delivers full output power to a load connected to its shaft. The windage and friction loss of the motor is 750W. Determine the i) mechanical power developed ii) Air gap power iii) rotor copper loss. 08
b) Derive torque equation in induction motor. 07
- Q.9 a) Explain capacitor start single phase induction motor with neat circuit diagram. 08
b) Explain the construction and working of variable reluctance stepper motor. 07
- Q.10 Write a short note on: 15
a) Armature reaction in DC generator.
b) Star-delta starter for 3-phase induction motor.
c) Speed control methods for DC series motor.

Total No. of Printed Pages:1

SUBJECT CODE NO:- H-1162
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y. B.Tech. (ETC) (Sem-IV)
Electromagnetic Engineering
[Old]

[Time: Two Hours]**[Max.Marks: 40]**

N.B

Please check whether you have got the right question paper.

1. Q.1 & Q.5 are compulsory.
2. Attempt any two questions from remaining.

Section A

- Q.1 Solve any three: 06
- i) Define electric potential.
 - ii) Write coulomb's law.
 - iii) Define curl.
 - iv) Define cross product.
- Q.2 Show that $\nabla \cdot \vec{E} = 0$ for field of uniform charge sheet. 07
- Q.3 Obtain the boundary conditions for conductor & free space. 07
- Q.4 State and prove Divergence theorem. 07

Section B

- Q.5 Solve any three: 06
- i) Define loss tangent.
 - ii) Write Stoke's theorem.
 - iii) Define electric dipole.
 - iv) What is retarded potential
- Q.6 Explain Maxwell's equations for Harmonically varying field. 07
- Q.7 Derive the expression of uniform plane wave. 07
- Q.8 Explain Biot-Savart law. 07

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-1163
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y. B.Tech. (ETC) CBC & Grading System (Sem-IV)
Electromagnetic Engineering
[Revised]

[Time: Two Hours]

[Max. Marks: 40]

Please check whether you have got the right question paper.

- N.B
1. Q.1 and Q.6 are compulsory.
 2. Solve any two questions from remaining from each section separated.

Section A

- | | | |
|-----|--|----|
| Q.1 | Solve any two
a) Compare dot product with cross products.
b) Derive relation between \vec{E} & \vec{D} .
c) State and prove Gauss's law. | 06 |
| Q.2 | Converts A (2,3,-2) is to spherical coordinates and $\beta(8, 25^\circ, \phi = 140^\circ)$ into Cartesian coordinates. | 07 |
| Q.3 | Find D is the region about a inform line charge of $8n\text{ c/m}$ lying along the Z axis is free space if $r=3m$. | 07 |
| Q.4 | Determine whether or not the following potential fields satisfy the Laplace's equations.
i) $V = x^2 - y^2 + Z^2$,
ii) $V = r \cos \phi + Z$
iii) $V = r \cos \theta + \phi$ | 07 |
| Q.5 | Derive Boundary conditions between conductor and free space. | 07 |

Section – B

- | | | |
|-----|---|----|
| Q.6 | Solve any three.
i) State Biot – savart law
ii) Write Maxwell's equation is free space.
iii) Define uniform plane wave & phase velocity.
iv) State Faraday's law and Lenz's law | 06 |
| Q.7 | Evaluate both side of stoke's theorem for the field $\vec{H} = 6xy \hat{a}_x - 3y^2 \hat{a}_y \text{ A/m}$ and the rectangular path along the region $2 \leq x \leq 5, -1 \leq y \leq 1, Z = 0$ let the positive direction of ds be \hat{a}_z . | 07 |

Q.8 If $E_y = 10.4e^{j(2\pi \times 10^9 t - \beta x)} \mu V/M$ in free space find.

- i) Phase velocity (V)
- ii) Phase constant (B)
- iii) Angular velocity (w)
- iv) Hm by property

07

Q.9 Explain Maxwell's equation is Harmonically varying field?

07

Q.10 State and prove stoke's theorem?

07

Total No. of Printed Pages:03

SUBJECT CODE NO:- H-1208
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (ETC) (Sem-III)
Electronics Devices & Circuits
[OLD]

[Time: Three Hours]

[Max.Marks: 80]

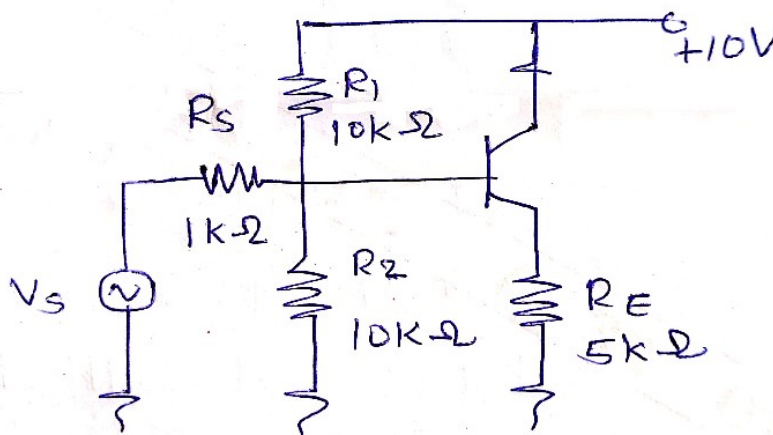
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Please check whether you have got the right question paper.

- i. Q. No. 1 & Q. No. 6 are compulsory.
- ii. Attempt any two questions from the remaining questions in each section.

Section A

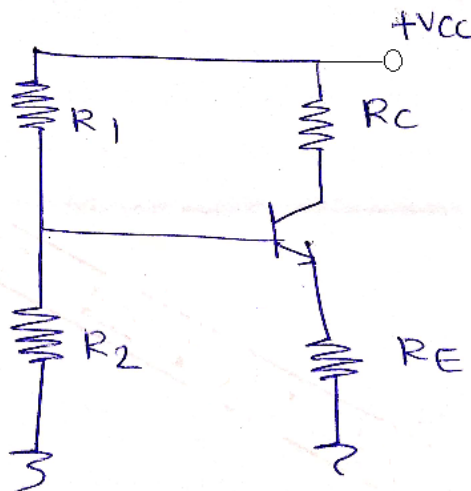
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|-----|--|----------|
| Q.1 | Solve any five: | 10 |
| | <ol style="list-style-type: none"> a) What is early effect? b) Define α & β of transistor. c) Enlist the types of biasing. d) What are the applications of h-parameters? e) What is bandwidth? f) Draw & label frequency response of single stage CE amplifier. | |
| Q.2 | <ol style="list-style-type: none"> a) How bias compensation is done in base bias with emitter feedback & derive expression for I_c, V_{CE} & S? b) Explain transistor as an amplifier. | 08
07 |
| Q.3 | <ol style="list-style-type: none"> a) Explain the effect of emitter bypass capacitor on amplifier parameters. b) Compare h parameters of all configurations. | 08
07 |
| Q.4 | a) For the single stage common collector amplifier circuit shown in figure. Calculate the value of R_i , R_o , A_i & A_v $\beta = 100$, $V_e' = 2S/IE(MA)$ | 08 |



- b) Draw the equivalent circuit of CE amplifier in terms of h-parameter & obtain the expression for voltage gain. 07

Q.5

- a) Derive the expression for the stability factor of a fixed bias. 07
 b) Determine the values of resistances for the circuit shown in fig. such that $I_c = 5\text{ mA}$, $V_{CE} = 6\text{ V}$, $V_c = 8\text{ V}$, $S = 10$, $\beta = 200$ & $V_{cc} = 20\text{ V}$ 08



Section B

Q.6

Solve any five:

- Enlist the characteristics of class C power amplifier.
- What is the difference between voltage & power amplifier
- Derive relation between μ , gm & rd .
- Define Transconductance & give its unit.
- Draw & label the circuit diagram of common gate amplifier.
- What is inversion layer in E type MOSFET.

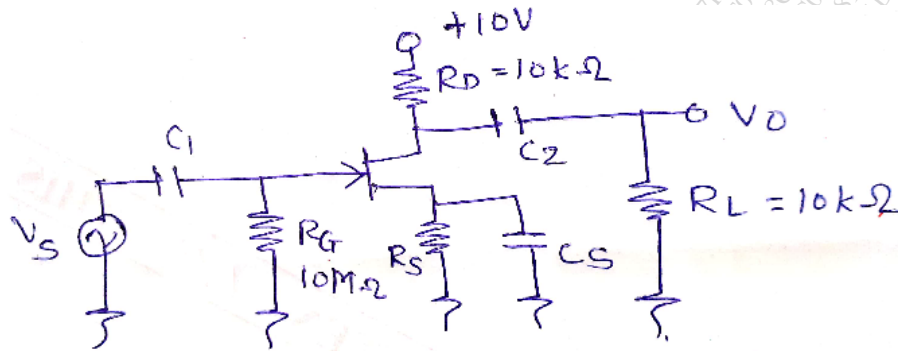
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Q.7

- What are biasing schemes available to achieve the required bias in a JFET? Explain any one of the biasing schemes. 08
- Give the advantages & disadvantages of push pull configuration in power amplifiers. 07

Q.8

- Calculate the values of voltage gain input resistance & output resistance of the amplifier shown in fig. if $gm = 4.2\text{ mA/V}$, $r_D = 40\text{ k}\Omega$. 08



b) Derive the expression for maximum conversion efficiency of class B power amplifier. 07

Q.9 a) Explain in detail V-MOSFET. 07

b) Explain depletion layer formation & operation of JFET. 08

Q.10 a) Draw drain characteristics of JFET & explain it. 08

b) Compare JFET & MOSFET. 07

Total No. of Printed Pages:3

SUBJECT CODE NO:- H-1209
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (ETC) (Sem-III)
Electronics Devices & Circuits
[Revised]

[Time: Three Hours]

[Max.Marks: 80]

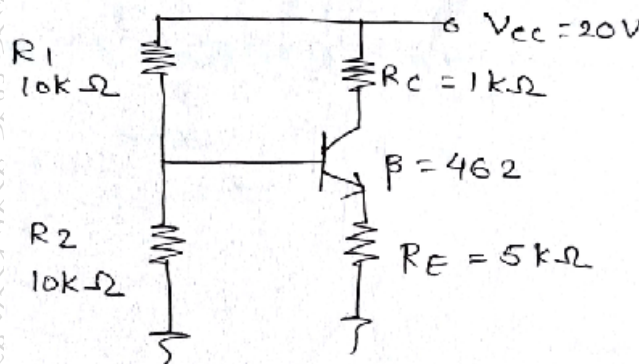
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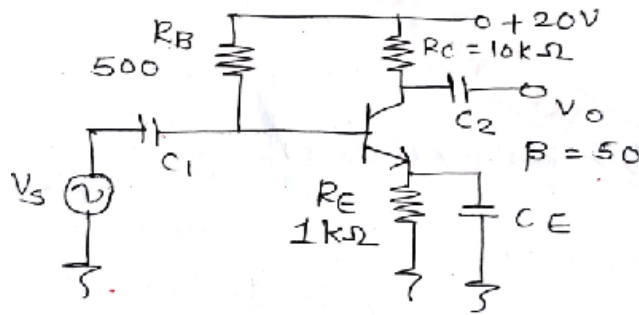
- i) Q.No.1 & Q. No.6 are compulsory.
 ii) Attempt any two questions from the remaining questions in each section.

Section – A

- Q.1 Solve any five: 10
- Define cut-off and active region of transistor.
 - Derive relationship between α & β .
 - Draw and label O/P characteristic of CE configuration.
 - What are biasing scheme for BJT?
 - State the need of biasing.
 - Define \emptyset point & dc load line.
- Q.2 a) Calculate the values of I_E , V_{CE} & V_E in the voltage divider circuit shown in figure. 08

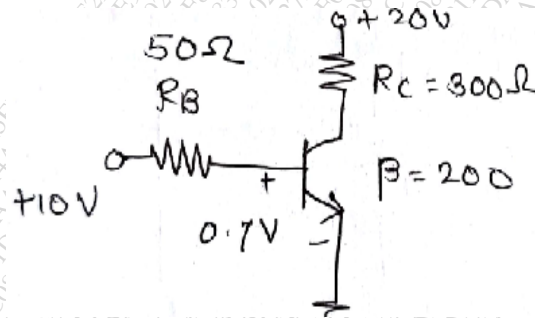


- b) Draw and explain frequency response of RC coupled amplifier. 07
- Q.3 a) A transistor used in a single stage common emitter amplifier shown in figure has $\beta=50$, Determine: 08
- Input resistance directly looking into base.
 - The total input resistance.
 - The O/P resistance
 - The voltage gain.



- b) Explain the base bias method & derive the expression for I_c , V_{CE} and S . 07

- Q.4 a) Figure shows amplifier circuit, Find upper & lower ends of the d.c. load line for the circuit 08 shown in fig. Also find Q point & locate it on load line.



- b) Define stability factor & derive expression for S . 07

- Q.5 a) A transistor connected in CE configuration has the following h-parameters 08
 $h_{ie} = 1.1 \text{ K}\Omega$, $h_{re} = 2.5 \times 10^{-4}$, $h_{fe} = 50$.
 $h_{oe} = 25 \mu\text{S}$, $r_s = r_L = 1 \text{ K}\Omega$. Calculate current gain, i/p impedance & voltage gain.
 b) Draw and explain O/P characteristic of CE configuration. 07

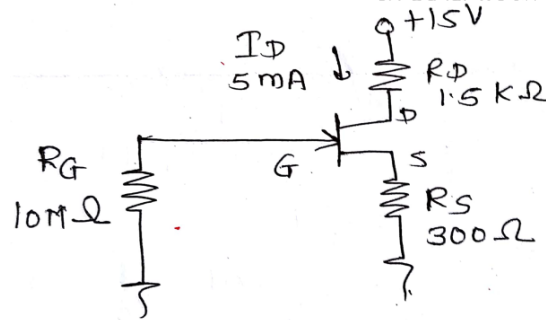
Section – B

- Q.6 Solve any five: 10
 a) State classification of power amplifier.
 b) What is power conversion efficiency?
 c) Give types of power amplifier.
 d) State applications of MOSFET.
 e) Draw circuit diagram of common source JFET amplifier.
 f) What is inversion layer in E-type MOSFET?

- Q.7 a) Explain MOSFET as a VLSI device. 07
 b) Explain (Give note on): 08
 (i) Power MOSFET.
 (ii) JFET parameters.

- Q.8 a) Explain class B push pull amplifier & find out its overall efficiency. 08
b) What is MOSFET? Explain its types with working. 07

- Q.9 a) Draw & explain drain & transfer characteristics of JFET. 08
b) Find the value of V_{DS} & V_{GS} . 07



- Q.10 a) Explain class A power amplifier with derivation of overall efficiency. 07
b) Give the biasing method for JFET & explain any one in detail. 08

Total No. of Printed Pages: 02

SUBJECT CODE NO:- H-1128
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y. B.Tech. (ETC) CBC & Grading System (Sem IV)
Elective-I OOPS using C++
[Revised]

[Time: Three Hours]**[Max.Marks: 80]**

N.B Please check whether you have got the right question paper.

- i) Question 1 & 6 are compulsory.
 ii) Attempt any two from remaining both sections.

Section A

- | | | |
|-----|--|----------|
| Q.1 | Attempt any FIVE. | 10 |
| | a. What are variables?
b. Feature of OOPS paradigm.
c. What is a class? Give example.
d. What is the use of Static?
e. Give example of Copy constructor.
f. Give 2 characteristics of destructor. | |
| Q.2 | a. Demonstrate use of constructor using example.
b. Give example of basic structure of C++ program. | 08
07 |
| Q.3 | a. Write C++ program to find if number is even or odd.
b. Compare POP & OOP paradigm. | 08
07 |
| Q.4 | a. What are the feature of C++?
b. Give example of static variables and static functions. | 08
07 |
| Q.5 | a. Demonstrate usage of friend function using example.
b. How to define destructor in C++ give example. | 08
07 |

Section B

- | | | |
|-----|---|----------|
| Q.6 | Attempt any FIVE | 10 |
| | a. Define inheritance
b. What are exceptions?
c. What are advantages of using pointers?
d. What is purpose of abstract class?
e. Define virtual functions.
f. Why do we do rethrowing of exceptions? | |
| Q.7 | a. Write C++ program for method overloading.
b. What are the rules of creating virtual functions? | 08
07 |

- Q.8 a. Demonstrate exception handling using C++ program. 08
 b. What are the rules of operator overloading? 07
- Q.9 a. How to perform call by value & Call by reference. Explain with example. 08
 b. Compare compile time & run time polymorphism. 07
- Q.10 a. Write program for single inheritance. 08
 b. How public & private inheritance different, Give example. 07

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-1242
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (ETC) (Sem III)
Networks & Lines
[OLD]

[Time: Three Hours]

[Max.Marks:80]

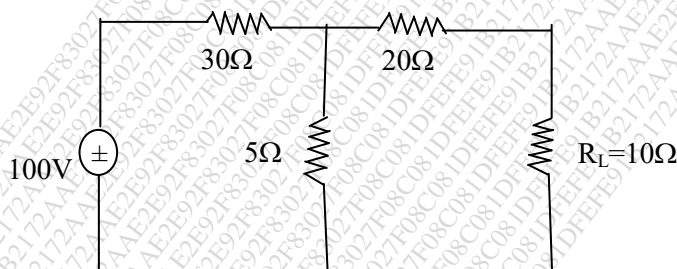
N.B

Please check whether you have got the right question paper.

1. Q.1 & Q.6 are compulsory.
2. Solve any two questions from Section-A & Section-B respectively.

Section A

- | | | |
|-----|--|----|
| Q.1 | Solve | 10 |
| | <ol style="list-style-type: none"> a. State Superposition theorem. b. Define Duality. c. What is Lumped network, give examples? d. Define quality factor. e. Write $f_0 = ?$ for series resonance circuit? | |
| Q.2 | a) By using max. Power transfer theorem calculate Power across $R_L = ?$ | 08 |



- | | | |
|-----|---|----|
| | b) State & Prove superposition Theorem. | 07 |
| Q.3 | a) Compare similarity & dissimilarities about Thevenins & Nortons theorems. | 07 |
| | b) In R.L.C series resonance circuit, if $R = 20\text{K}\Omega$, $L = 50\text{ mH}$ & $C = 1.5\text{ }\mu\text{f}$. Find out resonating frequency $f_0 = ?$ | 08 |
| Q.4 | a) Write a detailed note on Attenuator. | 07 |
| | b) Give classification of symmetrical & Asymmetrical network. | 08 |
| Q.5 | a) What is equalizer? Explain any one type of it? | 07 |
| | b) Calculate ' Z_0 ' for symmetrical 'T' & 'Π' network? | 08 |

Section B

- Q.6 Solve 10
- Define filter.
 - What is stub matching
 - Write cut-off freq. for Low pass filter.
 - What is transmission line? List out its type.
 - Write applications of smith chart.
- Q.7 08
07
- Write a note on composite m-derived filter?
 - Give detailed classification of filter.
- Q.8 08
- What is standing wave ratio?
Explain voltage standing wave ratio?
 - If $Z_{oc} = 970 \Omega$,
 $Z_{sc} = 105 \Omega$,
Find out the value of ' Z_0 ' for transmission line. 07
- Q.9 07
08
- Explain stub matching? also write a note on double stub matching.
 - What are the parameters of transmission line? Write in brief?
- Q.10 07
08
- Design m – derived HPF having $R_o = 100 \Omega$, with cut-off freq. of 1 KHz & infinite attenuation of 1.5 KHz?
 - In a transmission line value of
 $R = 40 \Omega$
 $L = 0.3 \text{ mH}$ & $C = 160 \mu\text{f}$
find out freq = ?
also find wavelength & velocity?

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-1243
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y. B.Tech. (ETC) (Sem-III)
Networks & Lines
[Revised]

[Time: Three Hours]

[Max.Marks:80]

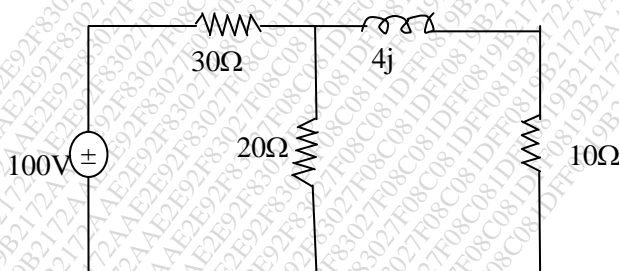
N.B

Please check whether you have got the right question paper.

- 1) Q.No.1 from section A and Q.No.6 from section B are compulsory.
- 2) Solve any two questions from remaining sections A & B respectively

Section A

- | | | |
|-----|--|---|
| Q.1 | Answer following questions. | 10 |
| | <ol style="list-style-type: none"> a. State KCL & KVL. b. Define Lumped network with examples. c. What is selectivity in resonance. d. Draw schematic diagram of symmetrical 'T' networks. e. Define equalizer. | |
| Q.2 | <ol style="list-style-type: none"> a) State and prove superposition Theorem. b) Use Thevenins theorem, find out I_L across 10Ω? | <div style="display: flex; justify-content: space-between;"> 07 08 </div> |



- | | | |
|-----|--|---|
| Q.3 | <ol style="list-style-type: none"> a) Write a detailed note on ABCD Parameter. b) If $R=20\Omega$, $L=40$ mH, Calculate the value of capacitor in series resonance circuit also find Quality factor. | <div style="display: flex; justify-content: space-between;"> 07 08 </div> |
| Q.4 | <ol style="list-style-type: none"> a) If $Z_1 = j100.48$, $Z_2 = -j1608$, Calculate the character. Impedance (Z_o) & Propagation constant (P) of 'T' symmetrical network. b) Draw & Derive parallel Resonance circuit? | <div style="display: flex; justify-content: space-between;"> 07 08 </div> |
| Q.5 | <ol style="list-style-type: none"> a) Write a detailed note on Equalizers. b) Define the terms, i) Bandwidth ii) Selectivity iii) Quality factor
iv) Magnification factor. | <div style="display: flex; justify-content: space-between;"> 07 08 </div> |

Section – B

- Q.6 Answer following questions. 10
- Draw schematic diagram of constant K-Low pass filter?
 - Define Stub matching.
 - What is reflection coefficient.
 - Define wavelength and velocity propagation of transmission line.
 - Write down frequency cut-off for constant K – High pass filter.
- Q.7 a) Define filter & it's types? Give detailed classifications of filter. 08
- b) What is transmission line? Discuss all types of transmission line. 07
- Q.8 a) Design constant K-HPF, with the value of $f_c=1.5$ KHz, $R_o=300\Omega$ & attenuation is 30 dB. 08
- b) Write a detailed note on ABCD parameter. 07
- Q.9 a) Design m-derived HPF having $R_o=900\Omega$ with cut-off freq. of 1.5 KHz & infinite attenuation of 1.8 KHz? 08
- b) If $Z_{oc} = 970 \angle -12^\circ$ & $Z_{sc}=100 \angle -54^\circ$, find out the value of 'Zo' for transmission line. 07
- Q.10 a) In a transmission line, value of $R=40\Omega/\text{Km}$, $L=0.3\text{mH}/\text{Km}$, $C=0.12 \mu\text{f}/\text{Km}$. Calculate the value of frequency? Also find out wavelength & velocity? 08
- b) What is stub matching ? Explain any type in detail. 07

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-1277
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (ETC) (Sem-III)
Principles of Communication Engineering
[OLD]

[Time: Three Hours]

[Max. Marks: 80]

Please check whether you have got the right question paper.

- N.B
- i. Q. No. 1 and Q. No. 6 are compulsory
 - ii. Out of questions no's 2 to 5 and question no's 7 to 10 solve any two questions respectively.

Section A

- | | | |
|-----|---|----------|
| Q.1 | Attempt any five | 10 |
| | <ol style="list-style-type: none"> a) Classify sources of Noise b) What is Noise figure? Write its formula. c) What is image frequency? d) Draw frequency spectrum for DSBFC, DSBSC. e) Define frequency modulation and write its formula of modulation index. f) Write the advantages of modulation? | |
| Q.2 | <ol style="list-style-type: none"> a) Derive non-linear resistance characteristics of diode which generate basic Am signal b) Define & explain <ol style="list-style-type: none"> 1) S/N ratio 2) Noise temperature 3) White Noise | 08
07 |
| Q.3 | <ol style="list-style-type: none"> a) Define and explain following terms <ol style="list-style-type: none"> 1) Sensitivity 2) selectivity 3) fidelity 4) double spotting b) Draw and explain block diagram of fm receiver | 08
07 |
| Q.4 | <ol style="list-style-type: none"> a) Derive instantaneous voltage equation for FM wave. b) Draw and explain separately excited mixer | 08
07 |
| Q.5 | <ol style="list-style-type: none"> a) Draw and explain High level modulation in detail. b) Draw circuit for pre-emphasis and de-emphasis and explain the same. | 08
07 |

Section B

- | | | |
|-----|---|----|
| Q.6 | Attempt any five | 10 |
| | <ol style="list-style-type: none"> a) Write broadcasting frequencies and if used in FM? b) What is capture effect? c) What is skip distance? d) What is MUF and write its formula? e) List the types of microphones. | |

- f) What are the requirements of Hi-fi system?
 g) What is use of enclosure and baffles?
- Q.7 a) Draw the circuit of ratio detector and explain the same. 08
 b) Draw and explain construction & working of horn type loudspeaker. 07
- Q.8 a) Compare horn, cone and electrodynamic loudspeakers. 08
 b) Draw and explain the circuit of phase discriminator in detail. 07
- Q.9 a) List different types of wave propagation and describe ground wave propagation? 08
 b) Draw and explain ribbon microphone in detail. 07
- Q.10 Write a short note (any three) 15
 a) Crystal microphone
 b) Marconi antenna
 c) Duct propagation
 d) Narrowband and wide band fm
 e) Horn loudspeaker

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-1278
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (ETC) (Sem-III)
Analog Communication
[Revised]

[Time: Three Hours]**[Max. Marks: 80]**

- N.B Please check whether you have got the right question paper.
- 1) Question No.1 and Q. No. 6 are compulsory.
 - 2) Out of Q.No.2 to 5 and Q. No. 7 to 10 solve any two from each Section.
- Section A

- | | | |
|-----|---|----------|
| Q.1 | Attempt any five:- | 10 |
| | <ol style="list-style-type: none"> a) Draw typical block diagram of receiver. b) What is white noise? c) What is signal to noise ratio? d) What is AGC? Why it is required in radio receiver? e) Define AM and write its formula of modulation index. f) List the limitations of diode detector. g) List the blocks of TRF receiver. | |
| Q.2 | <ol style="list-style-type: none"> a) Classify the sources of Noise and explain any one in detail. b) Define and explain following terms: a) Sensitivity b) Selectivity c) Double spotting. | 08
07 |
| Q.3 | <ol style="list-style-type: none"> a) Draw and explain separately excited mixers with its circuit diagram. b) Draw and explain generation of SSB using phase shift method. | 08
07 |
| Q.4 | <ol style="list-style-type: none"> a) Draw and explain high level of modulation in detail. b) Draw and explain operation of diode detector. | 08
07 |
| Q.5 | <ol style="list-style-type: none"> a) Draw and explain generation of SSB using third method. b) Draw and explain superhetrodyne receiver with its block diagram | 08
07 |

Section B

- | | | |
|-----|---|----|
| Q.6 | Attempt any five: | 10 |
| | <ol style="list-style-type: none"> a) Draw a varacter diode FM modulator. b) Define FM and write its formula for depth of modulation. c) What is double limiting in FM? d) Define 1) PAM 2) PWM e) What is Nyquist criteria? f) List the various stages of FM receiver. g) What is sampling theorem? | |

- Q.7 a) List different types of generation methods for FM and explain FET reactance modulator. 08
b) Draw and explain FM receiver in detail. 07
- Q.8 a) Draw and explain AFC type for FM generation. 08
b) Draw and explain circuit of ratio detector. 07
- Q.9 a) Draw the block diagram of PPM generation and demodulation with its waveforms. 08
b) Derive instantaneous voltage equations for FM wave. 07
- Q.10 Write short note (Any 3) 15
a) Pre-emphasis and de-emphasis
b) Noise triangle
c) PWM
d) Amplitude limiter.

Total No. of Printed Pages:2

SUBJECT CODE NO:- H- 1313
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (ETC) (Sem -III)
Digital Electronics
[Revised]

[Time: Three Hours]**[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B

1. Q.no.1 and 6 are compulsory
2. Solve any two question from remaining in section A and B.

Section A

- | | | |
|-----|--|----|
| Q.1 | Solve any five | 10 |
| | <ol style="list-style-type: none"> a) Define fan – in and fan –out b) Define and draw positive edge clock. c) Explain propagation delay. d) What is don't care condition e) Explain universal logic Gate f) Draw full subtractor circuits. | |
| Q.2 | a) Design full Adder circuit. | 07 |
| | b) Explain BCD to 7- segment decoder. | 08 |
| Q.3 | a) Explain the different Rules of K-Map optimization. | 07 |
| | b) Write short notes on Boolean algebra. | 08 |
| Q.4 | a) Explain Block diagram of 4:1 Mux and draw its internal circuit. | 07 |
| | b) Explain different Logic Gates with truth tables. | 08 |
| Q.5 | a) Design De-max 1:8 by using 1:2. | 07 |
| | b) Convert 239 into Binary, octal & Hex No. systems. | 08 |

Section B

- | | | |
|-----|--|----|
| Q.6 | Solve any five | 10 |
| | <ol style="list-style-type: none"> a) Define sequential circuit b) Define synchronous circuit c) Draw symbol & truth table of T- flip flop d) Define figure of merit e) Define propagation delay. f) Explain different current and voltage parameters of logic family. | |

- Q.7 a) Explain 1-Bit memory cell. 07
 b) Differentiate between flip- flop and latches. 08
- Q.8 a) Design Mod-6 counter. 07
 b) Draw diagram and waveform of 4 bit Ripple counter using T-flip flop. 08
- Q.9 a) Explain Universal shift Register. 07
 b) Explain operation of Johnson counter by means of wave form. 08
- Q.10 a) Explain classification of logic family. 07
 b) Explain CMOS inverter and state the advantages of CMOS logic family. 08

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-1360
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (ETC) (Sem-III)
Data Structure
[OLD]

[Time: Two Hours]**[Max.Marks:40]**

Please check whether you have got the right question paper.

- N.B
- i) Q.No.1 and 5 are compulsory.
 - ii) Solve any two from remaining from each section.
- Section A**

- Q.1 Solve any three from following.
- a) Define ADT. 02
 - b) What is the need for searching? 02
 - c) List out the area in which data structures are applied extensively. 02
 - d) What is stack? 02
- Q.2
- a) Explain the concept of sequential organization. 04
 - b) Explain Big oh, Theta and omega notation. 03
- Q.3
- a) Let use consider an array A[] that has the following elements : 04
 $A[] = \{30, 51, 28, 87, 62, 26, 15, 54\}$. Sort this array using the bubble sort. 03
 - b) Differentiate between linear and non-linear data structure.
- Q.4 Write short note on following. 07
- a) Data structure and its applications
 - b) Linear search with example
 - c) Sorting methods

Section B

- Q.5 Solve any three from following.
- a) What is Multiqueue? 02
 - b) Define leaf node. 02
 - c) What is singly linked list? 02
 - d) Define PUSH and POP operation. 02
- Q.6
- a) Explain the implementation of stack using array. 04
 - b) Describe the concept of Binary tree. 03
- Q.7
- a) List out and explain in detail types of linked list. 04
 - b) What do you understand by stack overflow and underflow conditions? Explain. 03

Q.8 Explain the terms.

- a) Tree
- b) Binary search tree
- c) Queue as an ADT

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-1361
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (ETC) (Sem-III)
Data Structure
[Revised]

[Time: TWO Hours]**[Max.Marks:40]**

N.B Please check whether you have got the right question paper.

- i. Question number 1 and 5 are compulsory.
- ii. Solve any two from remaining from each section.

Section A

Q.1 Solve any three from following

- | | | |
|----|--------------------------------------|----|
| a) | Define ordered list | 02 |
| b) | Illustrate the term searching | 02 |
| c) | Define LIFO | 02 |
| d) | What is a persistent data structure? | 02 |

Q.2 a) Explain the concept of binary search with example. 04

b) Consider a 18×5 two dimensional array marks, which has its base address =2000 and the size of an element = 2. Now compute the address of the elements, marks [16] [4]. Assuming that elements are stored in row major order. 03

Q.3 a) Define a bubble sort. Let us consider an array A[] has elements A [] = {32, 51, 25, 83, 68, 28, 15, 58}. Sort this array elements using bubble sort step by step. 04

b) Explain the concepts of static and dynamic data structure. 03

Q.4 Write short note on following 07

- a) Sequential organization
- b) Merge sort
- c) ADT

Section B

Q.5 Solve any three from following

- | | | |
|----|--|----|
| a) | What is a node in linked list? Give example. | 02 |
| b) | Define AVL. | 02 |
| c) | How is array different from linked list? | 02 |
| d) | Define complete binary tree | 02 |

- Q.6 a) Explain the concept of circular queue. How it is better than a linear queue? 04
- b) What are the key advantages and disadvantages of linked list? 03
- Q.7 a) Differentiate between B- tree and B+ tree. 03
- b) Write a function to implement PUSH and POP operation on stack. 04
- Q.8 Write short note on following 07
- a) Binary search tree
- b) Double linked list.
- c) Array Implementation of Queue

SUBJECT CODE NO:- H-136
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C) (Sem-II)
Signals & Systems
[OLD]

[Max. Marks: 80]

N.B

- 1) Q.No.1 from Section A and 6 from Section B are compulsory.
- 2) From remaining solve any two questions from each section.
- 3) Assume suitable data if required.

Q.1 Answer any five:-

10

- Q.2 a) What are different types of exponential signal in discrete form? Explain with sketches. 08
b) Check whether the following system are causal, dynamic, stable or not? 07

- Q.3 a) Find the convolution of $x(n) = (1, 2, -1, -2)$ and $h(n) = (-2, 1, 2)$ by equation. 08

- Q.4 a) Explain periodic & non periodic continuous time signal? 08
 Check whether the following signal is periodic or not?
 Find its fundamental period? $x(t) = \cos(\pi t/2) - \sin(\pi t/8) + 3\cos(\pi t/4 + \pi/3)$

- b) With block diagram explain following:- 07
- 1) Adder 2) Constant Multiplier 3) Signal Multiplier 4) Unit Delay
- 5) Unit Advance

Q.5 Write short notes on (any three)

15

- 1) Properties of convolution sum.
- 2) Integro differential equations.
- 3) Operations on signal
- 4) Application of Fourier series and Fourier transform to system analysis.

Section B

Q.6 Answer any five:-

10

- 1) Define ESD & PSD?
- 2) What is value of autocorrelation of energy signal at origin? Explain it.
- 3) What is significance of correlogram?
- 4) What is need of FT?
- 5) Explain Parseval's Power Theorem.
- 6) Define Fourier series. Explain its types.
- 7) State properties of auto correlation.
- 8) Express polar Fourier series equation.

Q.7 a) Find auto correlation of unit step signal?

08

b) State & prove the following properties of FT.

07

i) Differentiation in time domain

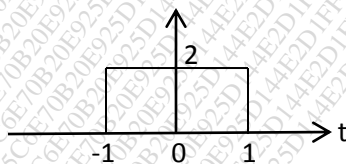
ii) Multiplication in time domain

Q.8 a) Find ESD of $x(t) = e^{-4t} \cdot u(t)$

08

b) Find the Fourier Transform of signal?

07

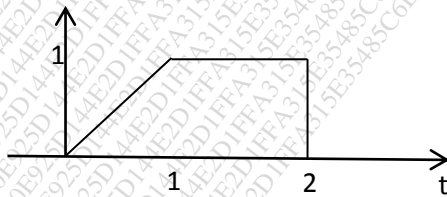


Q.9 a) State & explain properties of cross correlation of power signal?

08

b) Find ESD of

07



Q.10 Write short notes on (any three)

15

- 1) Sketch correlogram between $\sin(2\pi ft)$ & $\cos(2\pi ft)$
- 2) Effect of under sampling
- 3) Properties of PSD
- 4) Sampling and reconstruction

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-135
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C) (Sem-II)
High Speed Analog Devices
[REV]

[Time: Three Hours]**[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B

1. Q.No.1 and 6 are compulsory.
2. Solve any two questions from remaining from section A and B.

Section A

- | | | |
|-----|---|----------|
| Q.1 | Solve any five. | 10 |
| | <ol style="list-style-type: none"> 1) Enlist Non-linear Applications of OP-Amp. 2) Draw pin diagram of LM339. 3) Draw pin diagram of 565. 4) Define Lock Range. 5) What is slew Rate? 6) Define CMRR. | |
| Q.2 | <ol style="list-style-type: none"> a) Explain Summing Amplifier. b) Explain peak detector. | 07
08 |
| Q.3 | <ol style="list-style-type: none"> a) Explain operating principle of phase lock loop. b) Explain voltage to frequency convertor. | 07
08 |
| Q.4 | <ol style="list-style-type: none"> a) Explain AD8001 with its features and Applications. b) Compare between AD8001 and AD8002. | 07
08 |
| Q.5 | <ol style="list-style-type: none"> a) Explain Precision Rectifier. b) Explain ideal characteristics of OP-Amp. | 07
08 |

Section – B

- | | | |
|-----|--|----|
| Q.6 | Solve any five | 10 |
| | <ol style="list-style-type: none"> 1) Enlist different features of High speed ADC. 2) What do you mean by sampling 3) State successive approximation principle. 4) Explain Benefits of HEMT. 5) Enlist Applications of AD8011 6) Explain features of AD847 | |

- | | | |
|------|--|----|
| Q.7 | a) Explain the Applications of AD8001. | 07 |
| | b) Explain Noise comparison between VFB & CFB Amplifier. | 08 |
| Q.8 | a) Explain working principle of HEMT | 07 |
| | b) Write notes on Material used for high speed devices. | 08 |
| Q.9 | a) Explain differential live driver. | 07 |
| | b) Explain Mixer. | 08 |
| Q.10 | a) Explain software Radio. | 07 |
| | b) Explain successive approximation ADC. | 08 |

Total No. of Printed Pages:3

SUBJECT CODE NO:- H-170
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C) (Sem-II)
Digital Logic Design
[Revised]

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

N.B

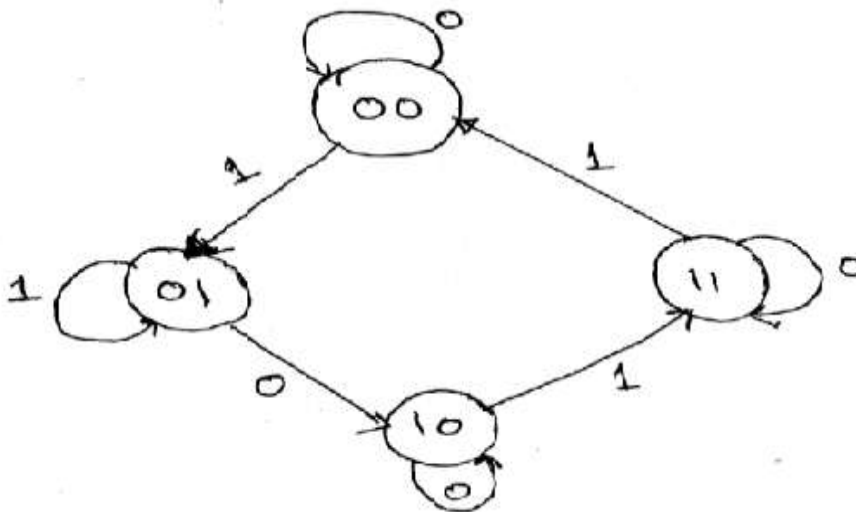
1. Questions No.1 from section A & questions No.6 from section B are compulsory.
2. From the remaining solve any two questions from each section.

Section -A

- Q.1 Solve any five from the following 10
- a) Classify logic families
 - b) List characteristics of digital IC's
 - c) Define 'Noise immunity'.
 - d) Convert (0011) Gray into Binary
 - e) Define minterms & maxterms
 - f) What is Don't care condition
 - g) Define combinational circuit with example
 - h) Draw 4:1 multiplexer
- Q.2 a) Explain CMOS Nand Gate . 07
- b) Explain operation of Transistor-Transistor logic. 08
- Q.3 a) Reduce the following expression using k-map & implement the same 08
- $$f(A, B, C, D) = \sum m(2, 3, 8, 10, 11, 12, 14, 15)$$
- a) Design Gray to Binary code converter. 07
- Q.4 a) Design 4 – bit Parity Generator & Checker. 07
- b) Minimize the following logical functions using Quine Mc- clusky method 08
- $$F = \prod M(0, 1, 2, 3, 7, 8, 10, 11, 15)$$
- Q.5 Write short note on the following (any three) 15
- a) BCD to seven segment decoder
 - b) Full Adder
 - c) ALU 74181
 - d) Digital comparator IC 7485
 - e) Characteristics of digital IC's

Section – B

- Q.6 Solve any five questions of the following 10
- State application of flip – flop
 - Differentiate betⁿ Synchronous & Asynchronous counter
 - Explain sequential logic ckt with an example
 - Draw state diagram of MOD-10 counter
 - Define Moore & Mealy Machine
 - Draw logic symbol of clocked SR flip -flop & write its truth table
 - Explain entity in VHDL with example
 - Explain is Race Around Condition
- Q.7 a) Explain the operation of SISO right shift Register with neat circuit diagram. 07
- b) Draw & explain JK flip- flop & its working. Also explain its truth-table. 08
- Q.8 a) Carry out the following conversions 08
- SR flip – flop to JK flip – flop
 - T flip – flop to D flip – flop
- b) Design 4 – bit asynchronous up- down counter. 07
- Q.9 a) Write VHDL code for all logic Gates. 08
- b) Design a sequential circuit using T flip - flop for the state diagram shown in fig below 07



Q.10 Write a short note on any three

- 1) SISO shift left shift Register
- 2) MS – JK flip- flop
- 3) IC 7490
- 4) Design steps of Asynchronous counter
- 5) Modeling styles of VHDL

15

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-171
FACULTY OF SCINCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C) (Sem-II)
Digital Logic Design
(OLD)

[Time: Three Hours]**[Max.Marks:80]**

N.B

Please check whether you have got the right question paper.

- 1) Question no.1 and 6 are compulsory.
- 2) Attempt any two remaining questions from each section.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data wherever necessary.

Section A

- | | | |
|-----|--|----------|
| Q.1 | Solve any five from the following:
a) Define minterm and maxterm.
b) Explain DCTL
c) Define and explain 'Fan in'.
d) Comment on 'Don't care condition'.
e) What is PAL? Explain
f) Draw and explain 4-variable K-map structure.
g) Build 2-input Ex-OR gate using NOR gates.
h) Convert following SOP expression to POS form:
$Y=AB+BC+C$ | 10 |
| Q.2 | (a) Explain ECL in detail
(b) Design binary to gray code converter | 07
08 |
| Q.3 | (a) Design 32:1 multiplexer using 8:1 multiplexers.
(b) Minimize the four variable logic function with the use of k-map:
$f(A, B, C, D) = \pi m(4, 6, 10, 12, 13, 15)$ | 08
07 |
| Q.4 | (a) Minimize the following expression using Quine McClusky method and implement using NOR gates only:
$f(A, B, C, D) = \Sigma m(1, 3, 7, 11, 15) + d(0, 2, 5)$
(b) Design 10-bit even parity generator | 09
06 |
| Q.5 | Write short notes (Solve any three):
a) RTL
b) BiCMOS Logic Family
c) Half-adder
d) Gray to binary code converter
e) Arithmetic Logic Unit | 15 |

Section B

- Q.6 Solve any five from the following: 10
- Enlist applications of shift register
 - Compare synchronous & asynchronous counter.
 - What do you mean by edge triggered flip-flap ?
 - State the applications of flip-flops.
 - Differentiate between sequential and combinational circuits.
 - Define A to D converter. What are its types?
 - Explain static RAM
 - Write applications of ADC.
- Q.7 a) Give the design procedure for asynchronous counter. 08
b) Design a sequence generator to generate the sequence 1010110. 07
- Q.8 a) Design mod-6 counter using J-K flip-flop. 07
b) Design and explain the working of mod-3 ripple counter. 08
- Q.9 a) Explain characteristics of ADC 0809 in detail. 08
b) Explain Moore machines. 07
- Q.10 Write short notes (Solve any three): 15
- RAM and ROM
 - Johnson's counter
 - EPROM and EEPROM
 - State diagram and state table
 - Mealy machines

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-205
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C) (Sem-II)
Signals and Systems
[Revised]

[Time: Three Hours]

[Max. Marks:80]

Please check whether you have got the right question paper.

N.B

- i) Q.No.1 from section A and 6 from section B are compulsory.
- ii) From remaining solve any two questions from each section.
- iii) Assume suitable data if required.

Section -A

- Q.1 Answer any five. 10
- (i) Obtain the FT of unit step signal?
 - (ii) Plot standard test signals?
 - (iii) Define causal system & non causal system
 - (iv) What is a need of FT?
 - (v) Prove that $\delta(n)=u(n)-u(n-1)$?
 - (vi) Compare energy signal & power signal
 - (vii) Define signal?
 - (viii) What is Convolution?
- Q.2 (a) Sketch $x(t)=[u(t)+r(t-1)-2u(t-3)].u(-t+5)$? 08
 (b) Explain convolution integral. 07
- Q.3 (a) What is system? Classify & explain with example. 08
 (b) Check whether the following systems are linear and time invariant or not: 07
 i) $y(t) + x^2(n) + x(n^2)$ ii) $y(t) = x(t)\sin t$
- Q.4 (a) Compute linear convolution by graphical method? $x(n) = \{1,2,1,2\}$ $h(n) = (2,1,2,1)$ 08
 (b) Find the Fourier transform of $x(t)=\cos(\omega t)$ plot the magnitude spectrum? 07
- Q.5 Write short notes on (any three) 15
- 1) Integro differential equation.
 - 2) Analogy between CT FS& DT FS.
 - 3) Properties of convolution sum.
 - 4) Folding & shifting operations of signal

Section B

- Q.6 Answer any five. 10
- (i) What is auto correlation & cross correlation?
 - (ii) Write any two system properties in terms of impulse response?
 - (iii) What is difference between ESD & PSD?
 - (iv) What is the application of correlation?
 - (v) What is correlogram?
 - (vi) State the convolution theorem for Laplace transforms.
 - (vii) What is Laplace Transform of Delta Function.
 - (viii) Prove the equation $R_x(0)=E$

- Q.7 (a) Find the Laplace transform of $x(t)=A \sin(t)$ for $0 < t < \pi$ 08
 $=0$ for $\pi < t < 2\pi$
- (b) State & Explain properties of Laplace transform 07
- Q.8 (a) Determine the auto correlation of the following power signal $x(t)=\sin\omega t$ 08
 (b) Prove that Auto correlation function ACF & power spectral density form a Fourier transform pair? 07
- Q.9 (a) Determine Autocorrelation of the sequence $x(n)=(0,1,2,3)$ 08
 (b) What is ESD? State and prove properties of ESD. 07
- Q.10 Write short notes on (any three) 15
- 1) Advantages of Laplace Transform over Fourier transform
 - 2) Properties of PSD
 - 3) Properties of ACF of energy signal
 - 4) Parseval's power theorem

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-206
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C) (Sem-II)
Electronics Devices & Circuits – II
[OLD]

[Time: Three Hours]

[Max. Marks:80]

N.B

Please check whether you have got the right question paper.

- 1) Q.1 from sections A and Q.6 from section B – are compulsory.
- 2) Solve any two questions from remaining questions from each section.
- 3) Assume suitable data wherever necessary.

Section A

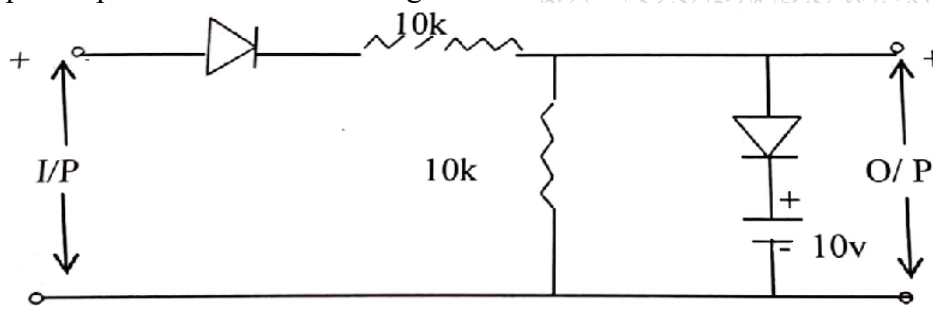
- | | | |
|-----|---|----------|
| Q.1 | Solve any five questions | 10 |
| | <ol style="list-style-type: none"> a) How power is dissipated in power amplifier? b) Draw the construction of IMPATT diode c) Explain working of LASER diode in brief d) What are ideal characteristics of op-amp? e) Draw I/P, O/P wave forms for class AB amp f) What is meant by push pull amplifier g) Give the different applications of BARITT diode h) Draw block diagram of operational amplifier | |
| Q.2 | <ol style="list-style-type: none"> a) Draw and explain V-I characteristics of Tunnel diode b) What is meant by CCD? Explain | 08
07 |
| Q.3 | <ol style="list-style-type: none"> a) Draw and explain transformer coupled amplifier b) Class – output stage has an efficiency of 60% if the maximum collector dissipation of each transistor is .5w, calculate the d.c input power and the a.c output power. | 08
07 |
| Q.4 | <ol style="list-style-type: none"> a) Derive dual input dual output AC analysis of operational Amplifier b) Explain why pulse amplifier is needed draw its freq. domain response | 08
07 |
| Q.5 | Write short note on (any three) <ol style="list-style-type: none"> a) Gunn diode b) Heat sink design c) Class-c amplifier d) Harmonic distortion in power amplifier | 15 |

Section B

- | | | |
|-----|--|----|
| Q.6 | Solve any five questions. | 10 |
| | <ol style="list-style-type: none"> a) What is sweep generator? b) What is clamper? Draw input and output waveform for positive clamper. c) Explain in brief the role of commutating capacitor in self-biased binary. d) Differentiate between symmetric and asymmetric triggering. e) What is RC control blocking oscillator? | |

- f) What are basic types of sweep generators?
- g) What is diode control blocking oscillator?
- h) What is the effect of positive clipper circuit?

- Q.7 a) What is the effect of positive biasing in positive clamper circuit? 08
b) Draw the frequency response of Differentiator for sine wave input. 07
- Q.8 a) Draw and explain AB Amplifier. 07
b) For the circuit shown below the input is $50 \sin \omega t$. draw the transfer characteristics and input output wave forms assuming ideal diodes 08



- Q.9 a) Draw and explain Monostable multivibrator 08
b) Draw and explain Miller's time base generator. 07
- Q.10 Write short note on (any three) 15
a) RC controlled blocking oscillator
b) Boot strap sweep generator
c) current time base generator
d) Integrator

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-277
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C) (Sem-II)
Electrical Machines & Instrumentation
[Revised]]

[Time: Three Hours]**[Max.Marks:80]**

N.B

Please check whether you have got the right question paper.

- i) Q. No.1 and Q.No.6 are compulsory.
- ii) Solve any two from remaining questions from each section.
- iii) Figures to the right indicates full marks.

Section – A

- | | | |
|-----|--|--------------|
| Q.1 | Attempt any five <ol style="list-style-type: none"> a) Draw circuit for long shunt DC compound motor with proper labelling. b) What are constraints for linear induction motor? c) DC series motor never runs at no load speed. Why? d) Compare dc series motor & dc shunt motor. e) What is the significance of back EMF? f) What is inverted V-curve of synchronous machine? g) What is the need of starter in dc motor h) Give principle of-repulsion motor. | 10 |
| Q.2 | <ol style="list-style-type: none"> a) Explain different methods of Breaking for DC Shunt motor. b) Draw and explain speed /Torque characteristics of DC Series motor. |
08
07 |
| Q.3 | <ol style="list-style-type: none"> a) Explain various power stages with losses & efficiency-induction motor. b) Explain working principle of synchronous motor. Why synchronous motor is not self-Starting. |
07
08 |
| Q.4 | <ol style="list-style-type: none"> a) Explain construction & working of stepper motor. b) Explain the construction and working of variable reluctance motor. |
07
08 |
| Q.5 | <ol style="list-style-type: none"> a) Explain 4 point starters with neat diagram b) Derive an EMF equation of DC motor. |
07
08 |

Section – B

- | | | |
|-----|--|----|
| Q.6 | Attempt any Five: <ol style="list-style-type: none"> a) What is Photosensitive Transducer? b) List different on/off timers. c) Give Application of piezoelectric effect. d) Give the classification of displays. e) What is RTC? f) List the property of ESD. | 10 |
|-----|--|----|

- g) Explain see back effect.
h) Explain Hall Effect in Transducer.
- Q.7 a) Explain optical Oscillograph with suitable diagram. List its applications. 08
b) Explain signal conditioning with neat circuit diagram. Also state the need. 07
- Q.8 a) Explain the working of VAW meter. 07
b) With a neat block diagram explain Burglar Alarm. 08
- Q.9 a) With neat circuit diagram explain strip chart recorders 08
b) Explain the working of Smoke & Fire Detector. 07
- Q.10 a) Describe the structure and working of Bar Graph display. 07
b) Explain the operation of x-y plotter. State its applications. 08

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-278
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C) (Sem-II)
Electrical Machines & Instrumentation
[OLD]

[Time: Three Hours]

[Max. Marks: 80]

N.B

Please check whether you have got the right question paper.

- 1) Question No. 1 and Q. No. 6 are compulsory.
- 2) Solve any two questions from remaining.

Section A

- | | | |
|-----|--|----|
| Q.1 | Answer any five | 10 |
| | <ol style="list-style-type: none"> i) Differentiate between DC machine and Generator. ii) What is the function of commutator in DC machine? iii) What are the types of DC motor? iv) What is the significance of back EMF? v) Explain the working principle of 3-phase I.M. vi) Write difference between Synchronous and Induction motor. vii) What is Hold ON coil? viii) Explain the working principle of stepper motor. | |
| Q.2 | a) Derive an EMF equation of DC generator. | 08 |
| | b) Draw and explain Speed/Torque characteristics of DC shunt motor. | 07 |
| Q.3 | a) Explain the construction of DC machine with neat sketch. | 08 |
| | b) Derive an EMF equation of DC generator. | 07 |
| Q.4 | a) Explain the different starters used for poly phase induction motors. | 08 |
| | b) Explain the working four point starter of DC shunt motor. | 07 |
| Q.5 | a) Explain the working principle of servo-motor. List its applications. | 08 |
| | b) Explain the construction of synchronous machine with neat sketch. | 07 |

Section B

- | | | |
|-----|---|----|
| Q.6 | Answer any five | 10 |
| | <ol style="list-style-type: none"> i. State merits and demerits of piezoelectric transducer. ii. What is difference between analog and digital transducer. iii. What is seebeck effect? iv. What is RTC? v. Explain the working principle of thermocouple. vi. State the four selection criteria for transducer. vii. Give the classification of recorders. viii. List the property of ESD. | |

- Q.7 a) With the suitable diagram explain the working of LVDT. 08
b) What are the different types of strain gauges? Derive the relation for gauge factor. 07
- Q.8 a) Explain the working of optical Oscilloscope. 07
b) What are the different types of photosensitive devices? Explain in brief. 08
- Q.9 a) Explain the operation of x-y plotter. And state its applications. 08
b) Explain the working of object counters. 07
- Q.10 Attempt any three 15
a) Digital Tachometer
b) Optical oscillograph
c) Liquid Crystal Display
d) Smoke Detector.

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-326
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C) (Sem-I)
Electronics Devices & Circuits-I
(OLD)

[Time: Three Hours]

[Max. Marks:80]

Please check whether you have got the right question paper.

- N.B.:i. Questions number one and six are compulsory.
 ii. Attempt any two questions from the remaining each section.
 iii. Figures to the right indicate full marks.
 iv. Assume suitable data if necessary.
 v. Use of non-programmable calculator is allowed.

Section – A

- | | | |
|-----|---|----|
| Q.1 | Solve any five of the following. | 10 |
| | i) Define Transition & Diffusion Capacitance of Diode.
ii) The transistor has $I_E = 15\text{mA}$ & $\alpha = 0.987$ and Calculate the value of I_C & I_B .
iii) What are the filter circuits? Explain.
iv) What is stability factor?
v) Why E-MOSFET is called as normally off Mosfet.
vi) Write the advantages of JFET over BJT.
vii) What is cross over distortion in class B Power amplifiers?
viii) Define PIV of Diode & Saturation Current. | |
| Q.2 | a) Draw and explain V-I Characteristics of PN Junction diode, also write diode current equation. | 08 |
| | b) Explain the operation of full wave rectifier using capacitor filter. Draw input and output waveforms. | 07 |
| Q.3 | a) Draw and explain the hybrid equivalent circuit for a common emitter transistor. | 08 |
| | b) Define Biasing. Explain Voltage Divider Biasing in detail. | 07 |
| Q.4 | a) Explain Depletion type MOSFET in detail. | 08 |
| | b) Explain the operation of JFET amplifier. Explain the JFET characteristics. | 07 |
| Q.5 | Write Short Notes on any three: | 15 |
| | i) R C coupled amplifier.
ii) Point Contact Diode.
iii) Avalanche & Zener Breakdown.
iv) Transistor as an Amplifier.
v) Handling Precautions of MOSFET | |

SECTION B

- | | | |
|-----|---|----|
| Q.6 | Solve any five: | 10 |
| | i) Define Bandwidth of an amplifier.
ii) What do you mean by damped and undamped oscillations? | |

- iii) What is opt coupler
- iv) What is meant by frequency response of an amplifier?
- v) What is meant by Gain Bandwidth product?
- vi) Give the basic difference point between Positive feedback and negative feedback.
- vii) What is an oscillator? How does it differ from an amplifier?
- viii) State Working Principle of Crystal Oscillator.

- Q.7 a) Explain with construction the following: 08
- i) Opto Coupler.
 - ii) Heterojunction Bipolar Transistor.
- b) Explain the effect of Coupling and bypass capacitor on the performance of BJT Amplifier. 07
- Q.8 a) Explain with some mathematical derivation the effect of negative feedback on input and output impedance, voltage gain, bandwidth and distortion of an amplifier. 08
- b) Explain Hartley Oscillator with neat circuit diagram. 07
- Q.9 a) Define f_α , f_β and f_T and give the relationship between them. 08
- b) In colpitts oscillator, the values of the Inductor and capacitors in the tank circuit are $L=40$, $C_1=100\text{PF}$ & $C_2=400\text{PF}$ Find: 07
- (i) The frequency of oscillations.
 - (ii) If the output voltage is 6 volt. Find the feedback voltage.
- Q.10 Write Short Note on (Any Three): 15
- i) Video Amplifier.
 - ii) Wien Bridge Oscillator.
 - iii) Variations of Hybrid π Parameter.
 - iv) Voltage Series feedback amplifier.
 - v) Tuned LC circuit.

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-327
FACULTY OF SCIENCE AND TECHNOLOGY
SE(ECT/E&C/IE) (Sem-I)
Electronics Devices & Circuits
[Revised]

[Time: Three Hours]

[Max. Marks:80]

Please check whether you have got the right question paper.

N.B.:

- 1) Q.1 and Q.6 are compulsory.
- 2) Solve any two from Q.2 , Q.3 , Q.4 and Q.5
- 3) Solve any two from Q.7, Q.8, Q.9 and Q.10
- 4) Figures to the right indicates full marks.
- 5) Assume suitable data, if necessary.

Section A

- | | | |
|-----|--|----------|
| Q.1 | Attempt any Five: | 10 |
| | <ol style="list-style-type: none"> a) Define Transition & Diffusion Capacitance of Diode. b) The transistor has $I_E = 15mA$ & $\alpha = 0.987$ and Calculate the value of I_C & I_B. c) Define PIV of Diode & Saturation Current. d) What is cross over distortion in class B Power amplifiers? e) What is multistage amplifier? State its applications. f) Draw FET as V.V.R. g) What is CMOS Inverter? | |
| Q.2 | <ol style="list-style-type: none"> a) Explain the operation of full wave rectifier using capacitor filter. Draw input and output waveforms. b) Explain the operation of negative and positive voltage clipping circuits. | 07 |
| Q.3 | <ol style="list-style-type: none"> a) Differentiate between all types of power amplifiers. b) Prove that efficiency of Class B Power amplifier is 78.5%. | 08
07 |
| Q.4 | <ol style="list-style-type: none"> a) Explain the operation of JFET amplifier. Explain the JFET characteristics. b) Explain N Channel & P-Channel MOSFETs with suitable diagrams. | 08
07 |
| Q.5 | Write notes on, (any three) | 15 |
| | <ol style="list-style-type: none"> a) Avalanche & Zener Breakdown b) Need of heat sink and its design in power amplifier. c) Clamping circuits d) R C coupled amplifier. | |

Section B

- | | | |
|-----|--|----|
| Q.6 | Answer the following questions (any five): | 10 |
| | <ol style="list-style-type: none"> a) Draw RC Integrator & Differentiator Circuits. b) What is role of commutating capacitor in multivibrator circuit? c) What is voltage series and current series feedback? d) State Barkhausen criteria of Oscillation. | |

- e) What is Bistablemultivibrator? Draw its circuit diagram.
 f) Give the principle of positive feedback.
 g) Draw the labeled circuit of Hartley oscillator.
- Q.7 a) Explain the working of differentiator with circuit diagram & waveforms. State its applications. 08
 b) What is a Schmitt trigger circuit? Explain in detail. 07
- Q.8 a) Draw and explain the operation of Colpit's oscillator. State its advantages. 08
 b) Explain the effect of negative feedback on input and output impedance, voltage and current gain, Bandwidth, Noise and Distortions. 07
- Q.9 a) With neat block diagram explain shunt voltage regulator. 08
 b) What is voltage multiplier? Explain the operation of voltage Quadruple circuit. State its application's. 07
- Q.10 Write note (Any three) 15
 a) Monostablemultivibrator
 b) Tuned LC circuit
 c) Three terminal Fixed DC IC voltage regulators
 d) RC Integrator

Total No. of Printed Pages:3

SUBJECT CODE NO:- H-361
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C) (Sem-I)
Network Analysis
[OLD]

[Time: Three Hours]

[Max. Marks:80]

Please check whether you have got the right question paper.

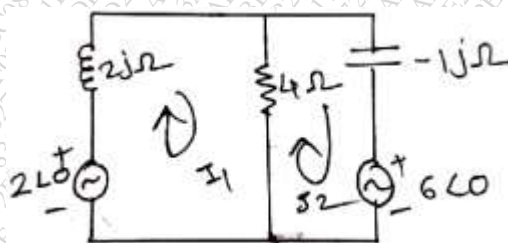
- N.B.: (i) Question No.1 from section A and Question no 6 from Section B are Compulsory.
(ii) From the remaining, solve any two questions from each Section.
(iii) Figures to the right indicate full Marks.

Section A

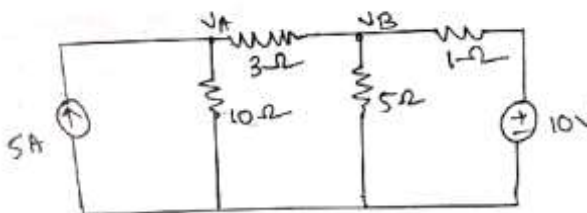
Q.1 Solve any five: 10

- a) State delta to star transformation with its important equations.
- b) State significant principle of duality.
- c) Define graph and tree.
- d) State the properties of incidence matrix.
- e) Define two terminal equalizers.
- f) Define kirchoff's voltage law.
- g) Define Thevenion's theorem.

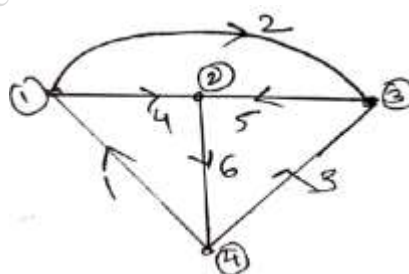
Q.2 a) Find I_1 & I_2 of the network shown by mesh analysis. 08



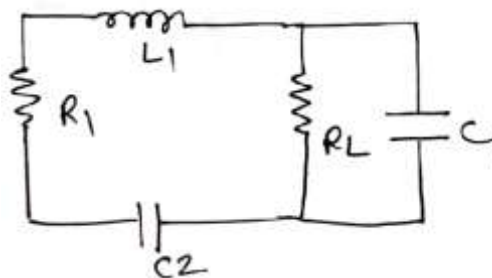
- b) For the network write the node voltage equation and find the current in each branch. 07



Q.3 a) Write the cut set matrix of the graph shown in following fig. 07

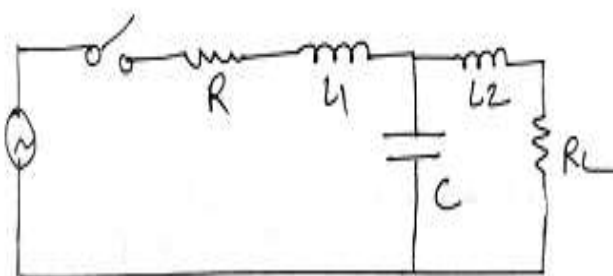


- b) A network shown in following fig, draw the oriented graph and hence obtain the incidence matrix. 08



Q.4

- a) Define duals and duality. Draw dual network of the given network. 08



- b) What is mesh or loop analysis? Explain with suitable example. 07

Q.5

Write a short note on:

- Compare series and parallel resonance.
- Derivation of star to delta conversion.
- Nodal analysis.

15

Section B

Q.6

Solve any five:

- State four important characteristics of resonant circuit.
- Explain briefly H parameters.
- Why ABCD parameters are called Transmission parameter.
- Write a note on initial conditions in basic circuit element.
- State Laplace transform of delayed standard time function.
- Write the Laplace transform of unit step and unit impulse signal.
- What are the different parameters of two port network?

15

Q.7

- b) A parallel resonate circuit has a coil of $150\mu\text{H}$ with a Q of 60 are resonated at 1 Mhz. The circuit is loaded by resistance of $20\text{k}\Omega$ is parallel. Calculate,

08

- Value of required capacitor.

- ii. Resistance of coil.
 - iii. Circuit impedance at resonance with load.
 - iv. Circuit impedance at resonance without load.
- c) Derive the relation between quality factor (Q_r) and detuning factor (δ) of RLC series circuit.

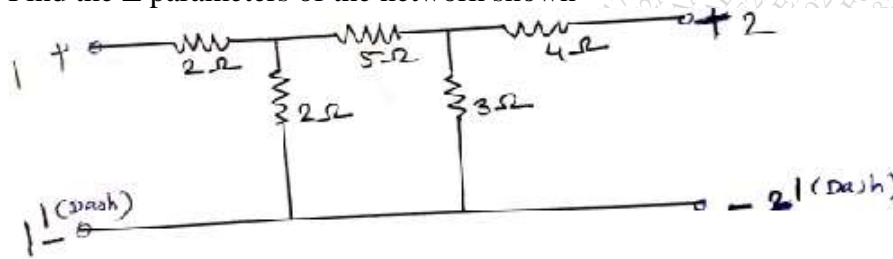
07

Q.8

- a) Establish relationship between Z and Y parameters.
- b) Find the Z parameters of the network shown

08

07



Q.9

- a) Define LT of function $f(t)$. Derive the LT of the standard time functions.
- b) A parallel circuit has a fixed capacitor and variable inductor Q of inductor is 4 and is constant. Find the value of L and C for the circuit impedance of $(100 + j0)$ at $f = 2.4$ Mhz. what is B.W at matched condition.

08

07

Q.10 Write a short note on:

15

- i. Comparison of series and parallel resonance
- ii. Condition of symmetry for Z-Parameter
- iii. Interconnection of two port network

Total No. of Printed Pages:4

SUBJECT CODE NO:- H-362
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (ECT/E&C/IE) (Sem-I)
Network Analysis
(Revised)

[Time: Three Hours]

[Max.Marks: 80]

Please check whether you have got the right question paper.

N.B

- 1) Q.No.1 and Q.No.6 are compulsory.
- 2) Solve any two from Q.2, Q.3, Q.4 and Q.5.
- 3) Solve any two from Q.7, Q.8, Q.9 and Q.10.
- 4) Figures to the right indicate full marks.
- 5) Assume suitable data, if necessary.

Q.1 Solve any five:

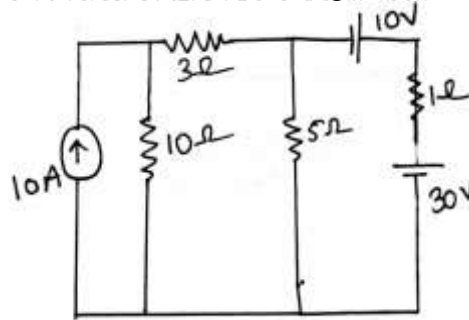
10

- a) Write the formula of star to delta conversion.
- b) What is meant by Super mesh and super node?
- c) State the principle of duality.
- d) What is meant by resonance?
- e) State the Dot Convention.
- f) Define graph and tree.

Q.2

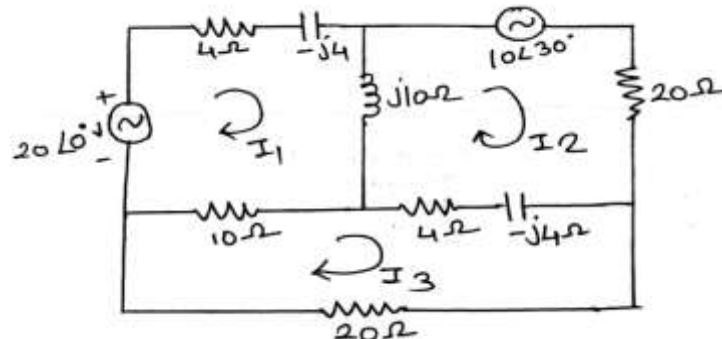
- a) By using source transformation find the current through $10\ \Omega$ resistance.

08



- b) Find the value of the current I_3 in the network shown in the fig.

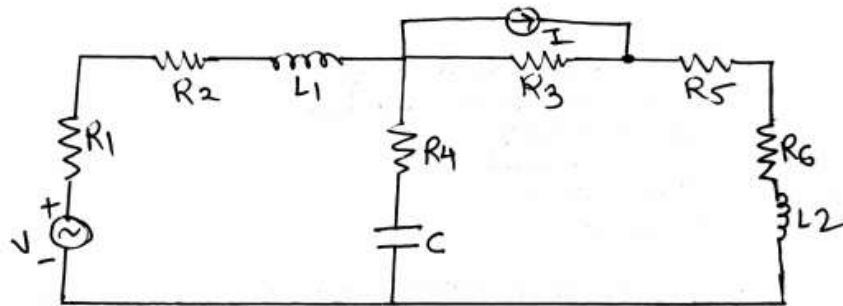
07



- Q.3 a) The reduced incidence matrix of oriented graph is given
- Draw the graph
 - How many trees are possible for this graph

$$A = \begin{bmatrix} 0 & -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & -1 & -1 \\ -1 & 0 & 0 & 0 & 1 \end{bmatrix}$$

- b) A network shown in following fig, draw the oriented graph and hence obtain the incidence matrix, tie set matrix and cut set matrix.



- Q.4 a) Explain the selectivity and bandwidth of parallel resonant circuit. 07
- b) A parallel circuit has a fixed capacitor and variable inductor Q of inductor is 4 and is constant. Find the value of L and C for the circuit impedance of $(100 + j0)$ at $f = 2.4$ Mhz. what is B.W at matched condition. 08

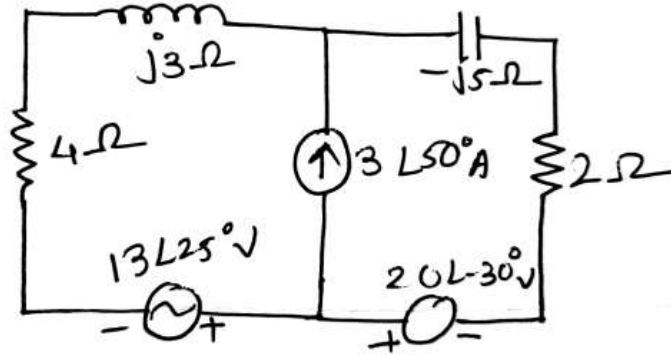
- Q.5 Write a short note on: 15
- Principle of duality.
 - Derivation of delta to star conversion.
 - Compare series and parallel resonance.
 - Significance of quality factor.

- Q.6 Solve any five: 10
- State Millman's theorem.
 - On the basis of frequency parameters classify the filters.
 - List the different types of transmission line.
 - State Thevenin's theorem.
 - Why ABCD parameters are called transmission parameters?
 - Why Y-parameters are called short circuit parameters.
 - State the limitations of superposition theorem.

Q.7

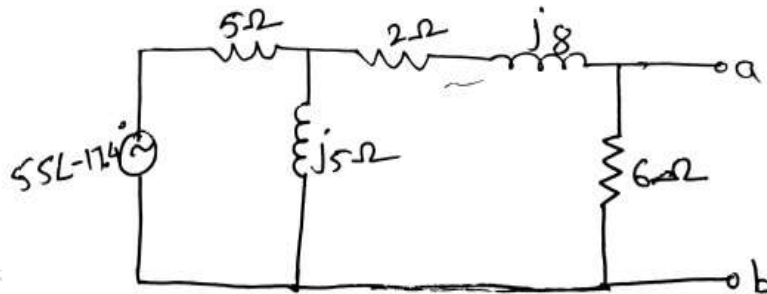
- a) Find the current I in the network shown by the superposition theorem.

08



- b) For the circuit shown obtain Thevenin equivalent circuit across a-b

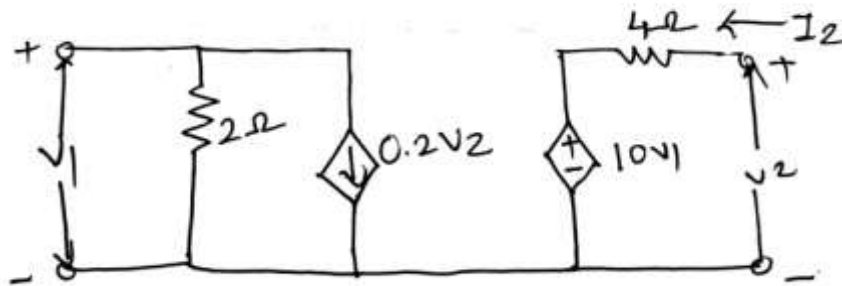
07



Q.8

- a) Find the Y-parameter of the network shown in figure

08



- b) Obtain Z-parameter in terms of H-parameter.

07

Q.9

- a) Explain Decibel and Neper. State the relation between them.

07

- b) Design constant K-low pass filter (π and T-section) having cut off frequency of 4 KHz and nominal characteristic impedance of 500Ω .

08

Q.10 Write short note on:

- Parallel connection of two port network.
- Explain the term primary constant and secondary constant of transmission line.
- Transmission line parameters.
- Compensation theorem.

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-395
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EC/ECT/IEC/E&C) (Sem-I)
Communication Engineering
[OLD]

[Time: Three Hours]

[Max. Marks:80]

Please check whether you have got the right question paper.

N.B.:1) Q. No. 1 and Q. No. 6 are compulsory.

2) Solve any two from remaining from each Section.

Section A

- | | | |
|-----|--|----------|
| Q.1 | Solve any five:- | 10 |
| | a) Define AM Modulation.
b) What do you mean by industrial Noise?
c) Which are the sources of Noise?
d) What is the function of carrier wave?
e) Draw the waveform of PM.
f) State the advantages of Super heterodyne receiver. | |
| Q.2 | a) Enlist the different types of modulations. Give comparison between AM and FM.
b) Which are the different Types of noise? | 08
07 |
| Q.3 | a) Explain the concept of VSB.
b) Explain the DSBSC. | 08
07 |
| Q.4 | a) Explain the working principle AF amplifier.
b) What do you mean by power amplifier? | 08
07 |
| Q.5 | a) Explain analog pulse modulation.
b) Give comparison between PM and FM. | 08
07 |

Section B

- | | | |
|-----|--|----|
| Q.6 | Solve any five | 10 |
| | a) Define brightness, saturation.
b) What do you mean by aliasing effect?
c) Explain electron gun in television.
d) State working principle of delta modulation.
e) Define quantization.
f) State the applications of magnetic recording. | |
| Q.7 | a) Explain the Horns and its applications. | 08 |

		H-395
	b) Explain the significance of PWM.	07
Q.8	a) Explain the different types of loudspeakers.	08
	b) Explain sampling theorem.	07
Q.9	a) Draw Block diagram of PA System and explain working.	08
	b) Write short notes on “multiplexing techniques”.	07
Q.10	a) Explain the working of Pressure operated type Microphone.	08
	b) Explain role of anode and cathode in picture tube.	07

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-396
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (ECT/E&C/IE) (Sem-I)
Analog Communication Engineering
[Revised]

[Time: Three Hours]

[Max. Marks:80]

Please check whether you have got the right question paper.

- N.B.:i) Question No.1 and Question No.6 are compulsory.
 ii) Attempt any two questions from remaining in each section.
 iii) Figures to right indicate full marks.
 iv) Assume suitable data, if necessary.

SECTION- A

- | | | |
|-----|--|----|
| Q.1 | Solve any Five | 10 |
| | a) What is baseband transmission and what are its disadvantages?
b) What is VSB? Give its application
c) Comparison between analog and digital signal
d) What are the advantages using modulation techniques?
e) Draw the wave form of AM and FM waves.
f) Define multiplexing technique & state its advantages?
g) What is the function of balanced modulator?
h) Define angle Modulation? Where it is used? | |
| Q.2 | a) Drive the expression for carrier power, power in side bands, total transmitted power and efficiency for AM signal. | 08 |
| | b) Draw and explain block diagram of basic communication system. | 07 |
| Q.3 | a) What is high and low level modulation? How high level modulation used in AM transmitter? | 08 |
| | b) Derive & explain mathematical expression for FM wave? | 07 |
| Q.4 | a) An AM transmitter radiates 9 KW of carrier power and delivers at its output 10.123 KW of power. What is the depth of modulation? if the same carrier is modulated with a sine wave of 40% modulation then finds total transmitted power. Now if both the signals simultaneously modulate this carrier then what is resultant transmitted power? | 08 |
| | b) Explain the phase shift method for the generation of SSB. | 07 |
| Q.5 | Write short note (any three) | 15 |
| | a) FDM Technique
b) Advantages and Disadvantages of FM
c) ISB
d) Noise Triangle in FM
e) Armstrong Method
f) Image frequency & its rejection | |

SECTION - B

Q.6	Solve any five questions	10
	a) State the types of FM demodulators. b) Define selectivity and fidelity of radio receive c) Define beamwidth of an antenna. d) Define tracking and state its types e) What is meant by Intermediate frequency? Give its typical value. f) Define AGC & its types. g) Define critical frequency and skip distance h) What is an antenna? What are its functions?	
Q.7	a) Explain the working of phase discriminator with suitable circuit diagram? b) What is the Principle of AGC? Explain simple and delayed AGC in detail.	08 07
Q.8	a) Explain working of amplitude limiter in FM receiver b) Explain simple diode detector what are its limitations.	08 07
Q.9	a) Compare Ground wave, Sky wave and Space wave propagation b) Explain noise figure and S/N ratio	08 07
Q.10	Write short note (any three)	15
	a) Mixer in receiver b) Space Wave propagation c) Types of Noise d) Characteristics of receiver e) MUF f) Skip distance & skip zone.	

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-430
FACULTY OF SCIENCE AND TECHNOLOGY
SE(EC/ECT/IE/E&C) (Sem-I)
Data Structure
[OLD]

[Time: Three Hours]

[Max. Marks:80]

Please check whether you have got the right question paper.

N.B.:1) Q. No.1 from Section A and 6 from Section B are compulsory.

2) From remaining solve any two questions from each Section.

Section A

- Q.1 Answer any five:- 10
- 1) What are the primitive operations performed on stack.
 - 2) What is push?
 - 3) Explain Insertion into circular queue.
 - 4) What is the Prefix And Post Fix Notation Of $(a + B) * (c + D)$?
 - 5) What are Application of Queue?
 - 6) What is priority queue?
 - 7) What is function?
 - 8) Explain one dimensional array with example.
- Q.2 a) Write an algorithm to convert infix expression to postfix expression. 08
b) Explain Circular queue in detail. 07
- Q.3 a) Using single dimensional, write a program to find average of numbers. 08
b) Explain doubly linked list. 07
- Q.4 a) Define linked list. Explain operations on singly linked lists. 08
b) Discuss storage classes in detail. 07
- Q.5 Write short notes on (any three) 15
- 1) Circular Queue
 - 2) Circular Linked list
 - 3) Concept of linked list
 - 4) Operation on Stack

Section B

- Q.6 Answer any five:- 10
- 1) What is merger sort?
 - 2) Define Heap.

- 3) State the properties of a binary tree.
- 4) What is sorting? What are the types of sorting?
- 5) What is a graph?
- 6) What is shortest path?
- 7) What are the tasks performed during postorder traversal?
- 8) What Is Tree Traversal?

Q.7	a) Write an algorithm for BFS and DFS.	08
	b) Explain spanning and minimum spanning tree.	07
Q.8	a) Explain selection sort with a program.	08
	b) Explain application of tree.	07
Q.9	a) Create a binary tree from the following sequence: 14,34,22,44,11,24,33	08
	b) Explain the Bubble sort with example.	07
Q.10	Write short notes on (any three)	15
	1) Sparse matrix	
	2) Merge sort with algorithm	
	3) Traversal technique of binary tree	
	4) Shell sort	

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-431
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (ECT/E&C/IE) (Sem-I)
Data Structure and Linux
[Revised]

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
1. Q. No. 1 & Q. No. 6 is compulsory.
 2. Attempt any two questions from Q. No. 2 to Q. No. 5 and from Q. No.7 to Q. No. 10 of each section.
 3. Figure to the right indicate full marks.

Section -A

- | | | |
|-----|---|----------|
| Q.1 | Attempt any five of following. | 10 |
| | <ol style="list-style-type: none"> a) Explain different types of Data structures. b) Write different operations on data structure. c) What are properties of binary tree d) Explain calloc () function. e) List drawbacks of static memory allocation. f) Explain pointer. g) What do you mean by circular queue? h) Define stack. Explain role of top pointer. | |
| Q.2 | <ol style="list-style-type: none"> a) Write c program to implement stack using array. b) Write array as an ADT. | 08
07 |
| Q.3 | <ol style="list-style-type: none"> a) Explain insert and delete operations on singly linked list. b) What is depth first search? Explain with an example. | 07
08 |
| Q.4 | <ol style="list-style-type: none"> a) Explain concept of preorder, postorder and inorder tree traversal. b) Write a program for representation of queue using arrays? | 08
07 |
| Q.5 | Write a short note on any three. | 15 |
| | <ol style="list-style-type: none"> i. Malloc () ii. Priority queue iii. Circular linked list iv. Comparison of linear and binary search. | |

Section – B

- | | | |
|-----|---|----|
| Q.6 | Solve any five | 10 |
| | <ol style="list-style-type: none"> i. What is directed graph and undirected graph? ii. Define infix, postfix and prefix notations. iii. What is incidental edge of a graph? iv. Define B + trees. | |

- v. Applications of trees.
- vi. Different features of Linux.
- vii. Write history of Linux operating system.

Q.7	a) Explain different file and directory handling commands of Linux OS.	08
	b) Explain any one tree traversal algorithm with example.	07
Q.8	a) Explain text and graphics editors of Linux OS.	08
	b) Explain linear search algorithm with example.	07
Q.9	a) Explain Merge sort algorithm with example.	07
	b) Explain bubble sort with a example.	08
Q.10	Write a short not an any three	15
	i. BFS	
	ii. User group management in Linux	
	iii. Linux file attributes	
	iv. Comparison of different sorting techniques sort.	

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-1028
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y. B.Tech. (ETC) (Sem-IV)
Integrated Circuits & Application
[Old]

[Time: Three Hours]**[Max. Marks: 80]**

Please check whether you have got the right question paper.

- N.B
- 1) Q.No.1 and Q.No.6 are compulsory.
 - 2) Solve any two questions from the remaining in each section.

Section A

- | | | |
|-----|---|----------|
| Q.1 | Solve any five: | 10 |
| | <ol style="list-style-type: none"> a) Explain peak detector with waveform. b) Explain clipping circuits with its types. c) Enlist the advantages of negative feedback. d) Define input-off set voltage. e) Define feedback. What do you mean by negative feedback? f) State classification of amplifier based on feedback topology. | |
| Q.2 | <ol style="list-style-type: none"> a) Explain voltage to current converter with floating load and grounded load. b) Explain offset nulling techniques used in op-amp. | 08
07 |
| Q.3 | <ol style="list-style-type: none"> a) Enlist general features of time base circuits. b) Explain the clamping circuits. | 08
07 |
| Q.4 | <ol style="list-style-type: none"> a) Give classification of amplifier based on feedback & explain any one. b) Draw the circuit diagram of colpitts oscillator & explain its operation. | 08
07 |
| Q.5 | <ol style="list-style-type: none"> a) Write a note on 'waveshaping circuits'. b) Explain RC phase shift oscillator. | 08
07 |

Section B

- | | | |
|-----|---|----------|
| Q.6 | Solve any five: | 10 |
| | <ol style="list-style-type: none"> a) Give two applications of VCD. b) State applications of IC 555. c) What is sample and hold circuit? Where it is used? d) Define load regulation. e) Draw block diagram of power supply. f) What are the two types of analog multiplier IC's? | |
| Q.7 | <ol style="list-style-type: none"> a) Explain KRC filter in detail. b) Explain all pass filter and its sensitivity analysis. | 07
08 |

- Q.8 a) Draw and explain block diagram of regulated power supply. 08
b) Explain adjustable voltage regulator. 07
- Q.9 a) Explain overload and short circuit protection causes and remedies. 08
b) Explain AM detector with a neat block diagram. 07
- Q.10 a) What are the various protection cktry used in regulators? Explain short ckt protection method. 08
b) Explain analog amplifier. 07

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-1029
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y. B.Tech. (ETC) CBC & Grading Sys (Sem IV)
Signals and Systems
[Revised]

[Time: Three Hours]

[Max.Marks: 80]

Please check whether you have got the right question paper.

- N.B
1. Q.no1 from section A & Q.no.6 from sections B are compulsory
 2. Answer any two questions from remaining questions each from section A & B
 3. Assume and state necessary data, if necessary
 4. Number shown on right indicates full marks.

Section A

- Q.1 Answer the following questions (any five) 10
- a) Determine the fundamental period of the signal $x(t) = \sin(12\pi t)$.
 - b) Give classification of the signals
 - c) What is stable system? Give any example.
 - d) State the properties of Autocorrelation.
 - e) State any four properties of Fourier series.
 - f) Define continuous time signal with suitable example.
- Q.2 a) Convolve the following two sequences 07
- $$x(n) = \{1,1,1,1\}, h(n) = \{3,2\}$$
- b) Find whether the following systems are dynamic or not 08
- i) $y(n) = x(n + 2)$
 - ii) $y(n) = x^2(n)$
 - iii) $y(n) = x(n - 2) + x(n)$
 - iv) $y(n) = x(2n)$
- Q.3 a) What is signal? Explain operations on signals. 07
- b) What is Autocorrelation? State any four properties of Autocorrelation. 08
- Q.4 ↓ 07
- a) Find the autocorrelation of the following signal $x_1(n) = [4,3,2,1]$
- b) Find the cross correlation of the 08
- $$x_1(n) = [2,3,4] \& x_2(n) = [1,2,3].$$
- ↑

- Q.5 a) What is system? give classification of systems? Explain stable and unstable system with example. 07
- b) Define unit step, unit ramp, delta function with suitable examples. 08

Section – B

- Q.6 Answer any five 10
- State time shifting property of Fourier Transform
 - Define power spectral density
 - State any two properties of transform
 - Write properties of ROC
 - State parseval's power theorem
 - Give the importance of Fourier transform.
- Q.7 a) A finite sequence $x(n)$ is defined as $x(n) = \{5, 3, -2, 0, 4, -3\}$ find $X(Z)$ 08
- b) Determine the energy spectral density of the $x(t) = 2 \cos(8\pi t)$ 07
- Q.8 a) Determine the inverse Z- Transform of the following $X(Z)$ by using partial fraction method 08
- $x(z) = \frac{1-4z^{-1}}{(1-z^{-1})(1-2z^{-1})}$ if the ROC's are
- $|Z| > 2$
 - $|z| < 1$
- b) State and prove the following two properties of Z- transform 07
- Linearity property
 - Time shifting property
- Q.9 a) Mention the similarities between ESD & PSD. 07
- b) State and prove following properties of Fourier transform 08
- Frequency shifting
 - Differentiation in time Domain
- Q.10 a) Find the Fourier transform of $f(t) = e^{-at}u(t)$. 07
- b) Find the Fourier Transform of Gaussian pulse. 08

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-1053
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (ETC) (Sem IV)
Communication Engineering
[OLD]

[Time: Three Hours]

[Max.Marks: 80]

- N.B Please check whether you have got the right question paper.
- i. Question No. 1 and Question No. 6 are compulsory.
 - ii. Out of question No. 2 to 5 and question No. 7 to 10 solve any two questions respective from each section.
- Section A**
- | | | |
|-----|---|----------|
| Q.1 | Attempt any five | 10 |
| | <ol style="list-style-type: none"> a) Draw the Pulse dialing waveform for no. 32 b) What is direct control switching system? c) What is blocking probability? d) What is Erlange & also give its formula e) What is skip zone? f) Draw International telephone number structure. g) Write the classification of switching systems. | |
| Q.2 | <ol style="list-style-type: none"> a) Draw and explain impulsing mechanism for rotary dial telephone. b) Draw block diagram of crossbar exchange organization and explain the same. | 08
07 |
| Q.3 | <ol style="list-style-type: none"> a) List the transmission system and explain any one in detail. b) Describe and delay system in detail | 08
07 |
| Q.4 | <ol style="list-style-type: none"> a) Draw and explain 3×3 crossbar exchange. b) Describe Incoming traffic and service time characterization. | 08
07 |
| Q.5 | <ol style="list-style-type: none"> a) Compare satellite communication & Terrestrial communication. b) Describe cable hierarchy for subscriber loops in detail. | 08
07 |

Section B

- | | | |
|-----|--|----|
| Q.6 | Attempt any five | 10 |
| | <ol style="list-style-type: none"> a) What is sampling theorem? b) What is aspect ratio? c) List the types of flat panel displays? d) Draw block diagram for PAM generation & demodulation. e) What is scanning process? f) List advantages of flat panel display. g) Define video signal and write its bandwidth | |

- Q.7 a) Draw and explain modulation and demodulation of PPM with the help of its block diagram and waveforms. 08
b) Describe CATV in detail. 07
- Q.8 a) Draw the neat diagram and explain horizontal resolution and video bandwidth 08
b) Draw the block diagram of PWM and explain the same. 07
- Q.9 a) Describe LCD display with the help of its diagrams. 08
b) Compare PAM, PWM and PPM techniques. 07
- Q.10 Write short note(any three) 15
a) DTH system
b) Nyquist criteria
c) Vertical resolution
d) LED display

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-1054
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y. B. Tech.(ETC) CBC & Grading System (Sem-IV)
Power Devices and Mechanics
(Revised)

[Time: Three Hours]**[Max.Marks: 80]**

Please check whether you have got the right question paper.

- N.B
1. Q.No.1 from section A & Q.No.6 from section B are compulsory.
 2. Solve any two from the remaining questions from each section.
 3. Assume suitable data, if required.

Section A

- | | | |
|-----|---|----------|
| Q.1 | Attempt the following. | 10 |
| | <ol style="list-style-type: none"> a) Define firing angle? b) Draw the symbol of IGBT and TRIAC? c) List the turn ON methods of SCR? d) Compare controlled rectifier and uncontrolled rectifier. e) Define inverter? | |
| Q.2 | <ol style="list-style-type: none"> a) Describe basic structure and working of SCR. b) Compare power BJT and power MOSFET? | 08
07 |
| Q.3 | <ol style="list-style-type: none"> a) Explain basic principle of operation of chopper? b) Derive an expression for average output voltage and rms voltage of single phase full converter with resistive load. | 07
08 |
| Q.4 | <ol style="list-style-type: none"> a) What is commutation? Explain class-D commutation with neat circuit diagram and waveforms. b) Describe RC-firing circuit with neat circuit diagram & waveforms. | 08
07 |
| Q.5 | Write short notes on: <ol style="list-style-type: none"> a) R-firing circuit b) Power diode c) Cycloconverter | 15 |

Section B

- Q.6 Attempt the following. 10
- Define the slip & write its range in three phase induction motor.
 - Classify dc machines.
 - Write any two applications of capacitor start and shaded pole single phase induction motor.
 - What are various conventional transformer connections?
 - Draw neat labeled circuit of 3 – ϕ slip ring induction motor.
- Q.7 a) The 4-pole dc generator has 100 turns; induced emf per turn is 10V. The per parallel path current and resistance of armature circuit of 10A and 2Ω respectively. Calculate the total emf induced in armature, total armature current and total power generated for lap connected dc generator. 08
- b) What are the speed control methods for dc shunt motor? Explain them. 07
- Q.8 a) Develop the torque equation for 3-phase induction motor. 08
- b) Explain capacitor start capacitor run single phase induction motor with neat circuit diagram. 07
- Q.9 a) Explain working and applications of dc servo motors. 08
- b) Distinguish between core type and shell type transformer with neat labeled circuit. 07
- Q.10 Write short note on: 15
- Starters in dc motors
 - Speed control methods in 3-phase induction motor
 - Variable reluctance stepper motor.

Total No. of Printed Pages: 02

SUBJECT CODE NO:- H-1079
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (ETC) (Sem IV)
Signals & Systems
[OLD]

[Time: Three Hours]

[Max.Marks: 80]

N.B

- Please check whether you have got the right question paper.
- Q. 1 & Q. 6 are compulsory.
 - Attempt any two questions from remaining in each section separately.

Section - A

- Q.1 Solve. 10
- Define time invariant and time variant systems.
 - What are Dirichet's conditions?
 - Define signal
 - What is static system? State with example.
 - Find fourier transform of $x(+)=1$.
- Q.2 08
- Consider $x(k) = (1, 2, 3, 4)$ & $b(k) = (-1, -2, -3, -4)$. Determine Linear convolution. 08
 $y(k) = x(k) \times h(k)$ using tabular method. (Sliding Tape method)
 - Determine whether the following systems are
 - Linear
 - Causal
 - Time invariant
 - Stable

$y(t) = e^{x(t)}$
 $y(n) = nx(n)$

07
- Q.3 08
- State and prove any two properties of Fourier transform.
 - Define basic signal with their graphical representation. 07
- Q.4 08
- A discrete time signal is given by $x(n) = \{3, 1, 2, 3, 1\}$ the draw.
 - $x(-n)$
 - $x(n+1)$
 - $x(n) x(n-1)$
 - $x(n-1) \delta(n-1)$

- b. Distinguish between.
1. Even and Odd signal
 2. Energy and Power signal

07

- Q.5 Write short notes.
1. Dirichlet's conditions
 2. Gibb's Phenomenon
 3. Fourier Transform

15

Section - B

- Q.6 Solve.
- a. What is PSD?
 - b. Write properties of cross-correlation.
 - c. Define spectrum.
 - d. What is particular solution?
 - e. Find inverse Z transform of $X(Z) = 1 + 2z^{-1} - 3z^{-2}$.

10

- Q.7 a. Find inverse Z – transform of

08

$$X(Z) = \frac{z + 2}{z^2 + 8z + 15} |Z| > 5$$

07

- b. Explain properties of Z-transform.

- Q.8 a. What is auto-correlations? Give its properties.
b. State and prove any two properties of Z-transform.

08

07

- Q.9 a. State and explain properties of ESD.
b. Determine particular solution for

08

07

$$y(n) + 2y(n - 1) + y(n - 2) = x(n) + x(n - 1) \text{ with } x(n) = \left[\frac{1}{2} \right]^n u(n)$$

- Q.10 Write notes.

- i. PSD
- ii. Auto correlation

07

08