(DEC 311)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year)

ELECTRONICS & COMMUNICATIONS

Paper – I : Linear Control Systems

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer one question from each unit ***(4×15 = 60)***

1) a) Define "Bounded input bounded output stability".

b) What is "Gain Margin"?

c) What is a time varying system?

d) Draw the basic waveform of a step signal.

e) What is low pass filter?

f) Define the terms of source and sink.

g) What are the advantages of Routh's criterion?

h) Define the terms of state vector and state variable.

i) What are the advantages of Nyquist method?

j) What are the effects of lead compensation?

k) What are the advantages of phase variable?

l) What is polar plot.

m) What is meant by linearity?

n) What is meant by functional block?

o) Define the term compensator.

UNIT - I

2) a) Compare open loop and closed loop control systems.

b) Clearly bring out, from basics, force-current and force- voltage analogies.

OR

3) With the help of neat diagrams, explain the working of any two practical examples for closed loop and open loop control systems.

UNIT - II

4) For a typical first order transfer function and second order transfer function,derive the expression for unit step, ramp response. Hence define 'time constant' and 'settling time'. Sketch the response indicating all salient features.

OR

5) Draw a neat sketch of the unit step, ramp response of prototype under damped second order system, indicating all important quantities and salient features. Distinguish between the 'transient response' and 'steady state response'.

UNIT - III

6) Briefly explain the Nyquist plot concept.

OR

7) What are the effects of adding

a) Pole b) Zero c) Zero to G(s) H(s) on root loci?

UNIT - IV

8) What do you understand by 'state transition matrix'? State and prove its properties. Explain state transition matrix by consider an example?

OR

9) What are the various types of compensating schemes used in control systems? Explain the concept of cascade lead compensator of control system with the help of an example.

(DEC 312)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Third Semester)

ELECTRONICS & COMMUNICATIONS

Paper – II : Electronic Circuits-II

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer one question from each unit ***(4×15 = 60)***

1) a) Define positive feedback.

b) Give an example for voltage series feedback.

c) What happens to the circuit in tuned amplifier above and below resonance.

d) Define Neutralization.

e) List the applications of mixer circuits.

f) Define 'Harmonic distortion'

g) List The conditions for oscillation.

h) Define 'Rise tune' and 'overshoot'.

UNIT – I

2) a) Derive an equation for power output and conversion efficiency of a class A Direct coupled amplifier.

b) Discuss the temperature considerations in power amplifiers.

OR

3) a) Explain the crossover distortion in class –B amplifiers .

b) Explain the features of complementary symmetry push pull amplifiers

UNIT - II

4) a***)*** Explain how negative feedback improves stability.

b) Explain colpits oscillators and derive the expression for frequency oscillation.

OR

5) a) With neat circuit diagram, explain wein bridge oscillator and derive an expression for frequency of oscillation.

b) Draw RC phase shift oscillator using FET and give its frequency of a oscillation.

UNIT - III

6) a) Explain the operation of a synchronously tuned amplifier.

b) Discuss how a transistors works as a chopper switch.

OR

7) a) Explain with a neat circuit the operation of a single tuned amplifier.

b) Write short notes on Balanced choppers.

UNIT - IV

8) a) Draw the short circuit, overload protection circuit and explain its operation.

b) Design a shunt regulation with the following Specifications V_o =15V, V_{in} =20 to 25V; I_L =25 to 50 mA; Iz = 20 to 45 mA.

OR

9) Write explanatory notes on

a) Switching mode power supplier.

b) Series regulator.

(DEC 313)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year)

ELECTRONICS & COMMUNICATIONS

Paper – III : Computer Organization

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer one question from each unit ***(4×15 = 60)***

1) Explain the following terms:

a) Register

b) Data transfer

c) Program control

d) Micro operations

e) Virtual memory.

UINT-I

2) Explain with example the implementation of register transfer?

OR

3) Discuss in detail about various arithmetic operations.

UNIT - II

4) What is an instruction code ? Explain in detail various addressing modes.

OR

5) Define interrupt? Explain the types of interrupts.

UNIT - III

6) Explain with neat diagrams, the address selection for control memory.

OR

7) Explain the design of control unit.

UNIT - IV

8) Explain about asynchronous data transfer and asynchronous communication interface.

OR

9) Explain about modes of transfer.

(DEC 314)

B.Tech. DEGREE EXAMINATION, DECEMBER - 2015

(Examination at the end of Third Year Third Semester)

ELECTRONICS & COMMUNICATIONS

Paper - IV : Pulse Circuits

Time : 03 Hours **Maximum Marks : 75**

Answer Question No.1 is compulsory ***(15)***

Answer One question from each unit ***(4×15=60)***

1) a) Explain the meaning of term linear waveshaping?

b) What is the need of commutating capacitor?

c) Explain damper diode action with peaking coil with circuit diagram?

d) Explain the operation of basic positive peak clipping with circuit diagram?

e) What is the relation between reactance and resistance of the RC low-pass filter at its lower 3 dB frequency f_1?

f) Discuss the methods of generating a time-base waveform?

g) What does collector catching diodes mean?

h) Write down the use (s) of ringing circuit?

UNIT –I

2) a) Explain the operation of RC high pass circuit with ramp input with circuit diagram?

b) A 10 Hz symmetrical square wave whose peak to peak is 2v is impressed upon a high pass circuit whose lower dB is 5Hz. Calculate.

i) Output and sketch the output waveform

ii) What is the peak to peak output amplitude?

OR

3) a) Explain the operation of RC ringing circuit with help of circuit diagram?

b) An ideal 1μs is fed to an amplifier. Calculate and plot the output waveform under the following conditions: the 3-dB frequency is

i) 10MHz ii) 1MHz iii) 0.1MHz?

UNIT –II

4) a) Explain the operation of a double diode clipper with help of circuit diagram and waveforms?

b) Explain steady state output for a square wave input of a clamping circuit?

OR

5) a) Explain how transistor acts as a switch? Design transistor switch inductive load?

b) Explain clamping operation with help of circuit diagram and waveforms?

UNIT –III

6) a) Design Astable Multivibrator and explain its operation with help of circuit diagram and waveforms?

b) Design the Astable Multivibrator to generate 5kHz square wave. The supply voltage V=10V, $I_c(sat)$ = 10mA, h_{fe}= 50, Assume silicon Transistor?

OR

7) a) Explain the operation of self- bias transistor Bistable Multivibrator?

b) Design a Schmitt trigger circuit for V_{cc} = 10V, UTP = 5V, LTP = 3V, Assume $h_{fe\ (min)}$ = 100 and $I_{c\ (min)}$ = 1mA?

UNIT -IV

8) a***)*** Explain the operation of an exponential sweep circuit with help of circuit diagram and waveforms?

b***)*** Design a free running UTP Sweep waveform generator with the sweep amplitude of 6v. The sweep interval of the waveform is expected to be 3 ms with negligible retrace interval. The slope error is 0.75. Determine the values of R_{b1}, R_{b2} V_{BB}, V,R and C?

OR

9) a) Describe an operation of triggered transistor blocking oscillator with base timing with circuit diagram and obtain an expression for the pulse width?

b***)*** Write down the advantages of diode controlled Astable blocking oscillator and RC controlled Astable blocking oscillator?

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(DEC 315)

B. Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Third Semester)

ELECTRONICS & COMMUNICATIONS

Paper – V : OOPS & OS

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) Explain all the following:

a) Function overloading.

b) Thrashing.

c) Swapping.

UNIT - I

2) Explain the concepts and benefits of OOPS.

OR

3) Briefly explain about Tokens, key words, Basic Data types and user defined Data types.

UNIT - II

4) Distinguish in detail about call by reference and return by reference.

OR

5) Explain with an example how do you specify a class and define member functions.

UNIT - III

6) Explain about Computer System architectures and operating system structures and distinguish them briefly.

OR

7) Define thread and explain in detail how the inter-process communication takes place.

UNIT – IV

8) Distinguish between logical vs physical Address space.

OR

9) Explain the purpose of Demand paging and page replacement algorithm.

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(DEC 316)

B. Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Third Semester)

ELECTRONICS & COMMUNICATIONS

Paper – VI : Analog Communication

Time : 3 Hours **Maximum Marks: 75**

Answer Question No. 1 compulsory. ***(15)***

Answer any ONE question from each unit. ***(4 × 15 = 60)***

1) a) Define AM and FM.

b) What do you mean by modulation index?

c) What do you mean by single tone modulation?

d) What is a pre-envelope?

e) Give & comparisons between FDM and TDM.

f) Draw modulated and demodulated AM.

g) What is a VSB?

h) What are the advantages of FDM?

UNIT - I

2) a) Discuss the demodulation of DSB-SC wave using coherent detection if phase error is present.

b) Explain the detection of AM wave using square law detector.

OR

3) a) Describe the generation of DSB-SC waves using balanced modulator.

b) The antenna current of an AM broadcast transmitter, modulated to a depth of 40% by an audio sine wave is 11A. It increases to 12A as a result of simultaneous modulation by another audio sine wave. What is the modulation index due to this second wave?

UNIT - II

4) a) Describe the generation of SSB-SC wave using phase discrimination method.

b) Compare AM techniques.

OR

5) a) Write short notes on FDM.

b) Write the complex low-pass representation of Narrow band signals.

UNIT - III

6) a) Explain demodulation of FM wave using zero crossing detector.

b) Explain detection of FM wave using PLL.

OR

7) a) Describe the generation of Narrow band FM.

b) What are the practical considerations of FM demodulation?

UNIT – IV

8) a) Draw the set for TDM and explain the operation.

b) Write short notes on preemphasis and De-emphasis in FM.

OR

9) a) Compare discrete modulation techniques.

b) Write short notes on capture effect in FM.

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(DEC 321)

B. Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Fourth Semester)

ELECTRONICS & COMMUNICATIONS

Paper – I : Linear Integrated Circuits & Applications

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory. ***(15)***

Answer One question from each unit. ***(4×15=60)***

1) a) Define virtual ground.

b) Explain CMRR.

c) Which type of feedback is present in Schmitt Trigger, justify your answer.

d) Differentiate precision Rectifier with rectifier.

e) Principle of oscillators.

f) Purpose of Reset PIN in 555 Timer.

g) Differentiate op-amp and comparator.

h) Define Lock range & capture range with respect to PLL .

i) Characteristics of A/D converters.

j) Explain error amplifier.

k) Why Butterworth filters are preferred over Chebhyshev.

UNIT-I

2) a) Design a unity gain summing amplifier to add three DC input voltages -0.5V, 0.1V, and 0.75V in inverting configuration. If the saturation voltages of the OP-AMP are +18V, and -18V, find the possible maximum gain of the amplifier.

b) Explain any two nonlinear applications of op-amp in detail.

OR

3) a) Explain the operation of different types of voltage to current converter circuits using op-amp. Mention four applications of V-I converter.

b) Give the design procedure of a compensating network for an OP-AMP which uses $\pm$10V supply voltages. Assume necessary data.

UNIT-II

4) a) Draw the schematic diagram of Wien Bridge Oscillator and derive the expression for frequency of oscillation.

b) Draw the circuit of Schmitt Trigger using an op-amp and derive the threshold voltages. Differentiate comparator and Schmitt Trigger.

OR

5) a) Derive the frequency of oscillation of a RC phase shift oscillator and explain the operation of the circuit.

b) Explain any two applications of comparator with the help of a circuit diagram.

UNIT-III

6) a) What is a sample and hold circuit? Draw the circuit diagram and explain its action.

b) Describe the principle of operation of a peak detector with waveforms.

c) Draw the circuit of weighted Resistor DAC and derive expression for output analog voltage V_0.

OR

7) a) Draw the clipper circuit and explain its operation of positive and negative clippers.

b) Give the schematic circuit of the fastest analog to digital converter. What is the main draw back of this converter? Compare this converter with other types.

UNIT-IV

8) a) Explain the operation of Monostable multivibrator using 555 timer. Derive the expression of time delay of a Monostable multivibrator using 555 timer.

b) For the all pass filter, determine the phase shift between input and output at $f = 2k\text{Hz}$. To obtain a positive phase shift, what modifications are necessary in the circuit.

OR

9) a) Explain the application of 555 Timer as Linear ramp generator.

b) Determine the order of Butterworth LPF so that at w=1.5 w_3 db, the magnitude response is down by atleast 30dB.

c) Explain Analog phase detector and VCO and describe their role in PLL.

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(DEC 322)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Fourth Semester)

ELECTRONICS & COMMUNICATIONS

Paper - II : Microprocessors and Interfacing

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) a) List four applications of microcomputer system.

b) What is stack and program counter?

c) What is machine cycle and instruction cycle?

d) Give the register classification of 8086.

e) What are the general data register?

f) Differentiate macro and subroutine.

g) What is the purpose of ALE signal in Minimum mode.

h) How BHE and AO is used in 8086?

UNIT - I

2) a) Draw the internal architecture of 8086 and explain.

b) Explain LEA and LAHF with examples.

OR

3) a) Explain the string instructions of 8086.

b) Explain LES and SAHF instructions with examples.

UNIT - II

4) a) Draw and explain memory read machine cycle in minimum mode.

b) Write short notes on ports in microcomputers system.

OR

5) a) Explain shift and rotate instructions. Write a program that includes the above instructions.

b) Explain the Bit manipulation instruction.

UNIT - III

6) a) Explain Handshake input/output.

b) Discuss D/A interfacing.

OR

7) a) Explain A/D interfacing.

b) Write short notes on programmable parallel ports.

UNIT - IV

8) a) Explain with neat block diagram 8251.

b) Write short notes on RS232C.

OR

9) a) Draw and explain the internal block diagram of 8259.

b) Draw and explain the memory write machine cycle in maximum mode.

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(DEC 323)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Fourth Semester)

ELECTRONICS & COMMUNICATIONS

Paper - III : Digital Signal Processing

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) a) Define impulse response.

b) Define a stable system.

c) State the term Duality.

d) How is shifting operation carried in signals?

e) Define Time reversal in Z-transform.

f) Define Differential property of DFT.

g) What is padding with zeros?

h) List applications of Z-transforms.

i) Define causality of LSI system.

j) Is $y(n) = \log_{10}|x(n)|$ linear say Yes/No.

k) Define sampling theorem.

l) What is a Sample and Hold circuit?

m) What is FFT?

n) List advantages of Digital filters.

o) List applications of windowing concept.

UNIT - I

2) a) Prove that the convolution in time domain leads to multiplication in frequency domain for discrete time signals.

b) Realize the following system with minimum number of multipliers.

$H(Z) = 0.5 + 0.75Z^{-1}+0.8Z^{-2} + 0.9Z^{-3}+2Z^{-4}+0.9Z^{-5}$.

OR

3) a) Check $y(n) = 3x(n-2) + 3x(n+2)$ is a causal system.

b) Determine the causal signal $x(n)$ having the Z-transform $X(Z) = \frac{Z^2+Z}{\left(Z-\frac{1}{2}\right)^2\left(Z-\frac{1}{4}\right)}$.

UNIT - II

4) a) Prove time shifting and frequency shifting of discrete fourier series.

b) Compute DFT of X(n) = {0, 1, 2, 3}.

OR

5) a) Determine the DFT of a sequence X(n) = {1, 1, 0, 0} and check the validity of answer by calculating IDFT.

b) Find the Fourier Transform of $X(n) = \left(\frac{1}{2}\right)^{n-1} u(n-1)X(n)$.

UNIT - III

6) a) Describe digital IIR filter characterization.

b) List merits and Demerits of Bilinear transformation.

OR

7) a) What is frequency warping? How it will arise?

b) Discuss impulse invariance method.

UNIT - IV

8) a) Outline the steps involved in the design of FIR filter using Hanning window.

b) Write the magnitude and phase functions of FIR filter when impulse response is symmetric and N is odd.

OR

9) a) Compare Rectangular, Hamming and Kaiser windows.

b) Explain the structure for realization of FIR system and draw the direct form structure of the FIR system described by the transfer function.

$H(Z) = 1 + \frac{1}{2}Z^{-1} + \frac{3}{4}Z^{-2} + \frac{1}{4}Z^{-3} + \frac{1}{2}Z^{-4} + \frac{1}{8}Z^{-5}$.

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(DEC 324)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Fourth Semester)

ELECTRONICS & COMMUNICATIONS

Paper - IV : Electronic Measurements and Instrumentation

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) a) Define accuracy and precision.

b) Give the range of wheatstone bridge.

c) Define strain.

d) What is a thermocouple?

e) What is a Multiplexer?

f) List advantages of Digital Voltmeters.

g) List advantages of thermocouple.

UNIT - I

2) a) List the probability of errors.

b) Explain the function of a DC ammeter. List the precautions to be used while using ammeter.

OR

3) a) Draw a neat figure and explain Kelvin's bridge.

b) With a neat circuit diagram explain shunt type ohmmeter.

UNIT - II

4) a) Explain the True RMS voltmeter.

b) Draw a neat figure of CRT and explain its features.

OR

5) a) Explain the working of frequency counter.

b) Draw a stair care ramp digital voltmeter and explain its function.

UNIT - III

6) a) Explain the working of a semiconductor strain gauge.

b) Draw a neat figure of capacitive transducer and explain its operation.

OR

7) a) List the features of Digital transducers.

b) Explain the operation of a Resistance thermometer.

UNIT - IV

8) a) Explain computer controlled instrumentation.

b) How do you take measurement of electrical activity of muscle.

OR

9) Write short notes on:

a) Types of multiplexing in DAS.

b) EEG.

(DEC 325)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Fourth Semester)

ELECTRONICS & COMMUNICATIONS

Paper - V : Digital Communications

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) a) What is the principal of touching tone dialing scheme?

b) What is meant by sensitivity?

c) What is the need for telecommunication networks?

d) What is the use of frequency multiplier?

e) What is meant by intermediate frequency?

f) What are the advantages of electronic switching over manual switching?

g) What are the different source specific telecommunication networks?

h) What is Analog time division switching system?

i) What is meant by Videotext service?

j) What type of modulation is used for TV Transmission?

k) What is Dark Current?

l) Define Aperture correction?

m) What is saturation?

n) What is the use of color burst in PAL system?

o) Which camera tube is suitable for outdoor location?

UNIT - I

2) a) Explain the operation of FM transmitter and Draw the modified Diagram for Frequency stability.

b) Calculate the image rejection of a radio receiver having an RF amplifier and an IF of 450Hz. If the Q's of the relevant coils are 65 at an incoming frequency of

i) 1200 Hz

ii) 20 MHz

OR

3) a) Draw the block diagram of AM radio receiver and Explain the function of each block?

b) Mention advantages of Super heterodyne Receiver over TRF receiver.

UNIT - II

4) a) Compare the features of single stage and multistage switching network configurations?

b) Write about the Design parameters for time division space switching and compare with that of a time division time switching?

OR

5) a) What are the elements of a switching system? Explain the function of each element?

b) What is SPC? Discuss in detail about Centralized SPC?

UNIT - III

6) a) Why an odd number of lines are used for scanning? How does Interlaced Scanning help to reduce the Bandwidth of Video signal?

b) How luminance signal is obtained? Why chrominance signal is preferred over luminance signal?

OR

7) a) Write down the Principle of operation, Explain the constructional details of Image Orthicon with the help of block diagram.

b) When both side bands are fully transmitted calculate total channel bandwidth require for transmission? Explain how Channel bandwidth is reduced to 7MHz by allowing VSB transmission?

UNIT - IV

8) a) Explain how colors represented on the Chromacity diagram? What is the significance of the chromacity diagram in color TV?

b) Explain the concept of mixing of colors with the help of Venn diagram?

OR

9) a) Draw the block diagram of NTSC encoder? Explain RGB inputs, YIQ signals and mixer outputs?

b) Write short notes on Digital TV?

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(DEC 326)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Third Year Fourth Semester)

ELECTRONICS & COMMUNICATIONS

Paper - VI : Communication Systems

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) a) What is BW required for video signal transmission?

b) What is meant by selectivity?

c) What is meant by fidelity?

d) What is the use of frequency multiplier?

e) What are the limiters in TRF receiver?

f) What is the use of RF power amplifier?

g) What is digital time division switching system?

h) What are the advantages of electronic switching over manual switching?

i) What is meant by subscriber loop signaling?

j) Explain Halo effect.

k) Define Shading correction.

l) Explain the phenomena of Photoconductive lag.

m) Give the Significance of Chromacity Diagram?

n) What is color burst signal?

o) Define Depth of Field.

UNIT - I

2) a) Draw the block diagram of TRF receiver? Write its limitations.

b) A super heterodyne receiver is to tune the range from 4-10MHz with an IF of 1.8MHz. Calculate the range of oscillator frequency and the range of Image frequency.

OR

3) a) What is Delayed AGC, explain with the help of block diagram?

b) What is the necessity for Tracking in Radio Receivers? Explain with circuit Diagram.

UNIT - II

4) a) Explain the working of two stage combination stitching.

b) Discuss about phased operation and slotted operation in time division time switching.

OR

5) a) What is SPC? Discuss in detail about Distributed SPC.

b) Determine switch advantage ratio of a three stage network with N inlets and N outlets for the cases when

i) N = 128 and

ii) N = 32768

UNIT - III

6) a) Explain how horizontal sync pulses are separated from composite video signal.

b) Which type of modulation is preferred for TV transmission among positive and negative modulation? Justify it.

OR

7) a) Write down the Principle of operation, Explain the constructional details of plumbicon with the help of block diagram.

b) Explain the need of pre and post equalizing pulses with schematics?

UNIT - IV

8) a) Explain the concept of additive mixing and subtractive mixing of colors with the help of Venn diagram.

b) Describe the construction of a color TV camera and its Optical system using Dichroic mirrors or Prisms?

OR

9) a) Explain PAL encoder with the help of block diagram.

b) Write short notes on DTH.

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