UPSEE 2019

PAPER-EC: CODE AA*

ANSWER KEY, Examination Date: 21-04-2019

1	C	26	C	51	A	76	D
2	A	27	B	52	A	77	B
3	A	28	D	53	B	78	B
4	C	29	A	54	B	79	A
5	D	30	C	55	A	80	B
6	C	31	D	56	C	81	C
7	B	32	A	57	A	82	A
8	A	33	C	58	C	83	D
9	D	34	B	59	D	84	C
10	B	35	C	60	D	85	C
11	D	36	A	61	C	86	B
12	B	37	B	62	B	87	D
13	B	38	D	63	B	88	C
14	A	39	A	64	D	89	A
15	B	40	B	65	C	90	B
16	B	41	B	66	D	91	D
17	B	42	D	67	A	92	B
18	A	43	C	68	B	93	C
19	A	44	A	69	B	94	B
20	B	45	B	70	D	95	B
21	D	46	C	71	D	96	D
22	C	47	B	72	D	97	A
23	B	48	C	73	C	98	D
24	A	49	B	74	A	99	B
25	D	50	C	75	A	100	B

Note: **In case of any grievance, it must be reported at upseegrievance@aktu.ac.in along with Students Roll No. with Paper Code, Question Booklet Code, Question No. and suggested answer with supporting documents on or before 03rd May 2019.**

*प्रश्न पुस्तिका क्रमांक **AA** का प्रश्नपत्र एवं कुंजी प्रकाशित की जा रही है। प्रश्न पुस्तिका क्रमांक **BB, CC** तथा **DD** में प्रश्नों एवं उनके विकल्पों का क्रम परिवर्तित है कृपया तद्नुसार उत्तर मिलान करें।

EC

Question Booklet Sr. No.

Q. Booklet Code

AA

Roll No.

OMR Answer Sheet No.

Declaration :
I have read and understood the instructions given on page No. 1

Signature of Candidate
as signed in application)

Seal of Superintendent of Examination Centre

Signature of the Invigilator

Name of Candidate :

To be copied by the candidate in your own handwriting in the space given below for this purpose is compulsory.
"You will know you are in the right profession when : you wake anxious to go to work, you want to do your best daily, and you know your work is important."

*** After cutting half upper part of this page, invigilator preserve it along with student's OMR sheet.**

No. of Pages in Booklet including title	16	Time 2 Hours	Marks 400	No. of Questions in Booklet	100

EC

Question Booklet Sr. No.

Roll No.

Signature of the Invigilator

Q. Booklet Code

AA

Name of Candidate :

INSTRUCTIONS TO CANDIDATE

1. Use BLUE or BLACK BALL POINT PEN only for all entries and for filling the bubbles in the OMR Answer Sheet.
2. Before opening the SECURITY SEAL of the question booklet, write your Name, Roll Number (In figures), and OMR Answer-sheet Number in the space provided at the top of the Question Booklet. Non-compliance of these instructions would mean that the Answer Sheet can not be evaluated leading the disqualification of the candidate.
3. Each question carries FOUR marks. There will be negative marking on wrong answer. FOUR marks will be awarded for each correct answer and ONE mark will be deducted for each wrong answer. No marks will be deducted/awarded for unattempted questions.
4. Each multiple choice question has only one correct answer. More than one answer indicated against a question will be treated as incorrect answer.
5. Use of log table, mobile phones, any electronic gadget and slide rule etc. is strictly prohibited. Non-programmable calculator is permitted.
6. Candidate will be allowed to leave the examination hall at the end of examination time period only.
7. If a candidate is found in possession of books or any other printed or written material from which he/she might derive assistance, he/she is liable to be treated as disqualified. Similarly, if a candidate is found giving or obtaining (or attempting to give or obtain) assistance from any source, he/she is liable to be disqualified.
8. OMR sheet is placed within this paper and can be taken out from this paper but seal of paper must be opened only at the start of paper.
9. This booklet contains TWO Sections, Section A (Aptitude & Mathematics) has 30 Questions to be attempted and Section B (Subject domain) has 70 Questions to be attempted.

EC

Section - A :

General Aptitude	:	Q. 1 to Q. 15
Mathematics	:	Q. 16 to Q. 30

Section - B :

Electronics & Communication	:	Q. 31 to Q. 100

001. Antonym of word "Dissent" is:

(A) Renounce (B) Adopt

(C) Agree (D) Give

002. Synonym of work "Impudent" is:

(A) Insolent (B) Partial

(C) Bankrupt (D) Restive

003. Find out which part of the sentence has an error. If there is no mistake, the answer is 'No error'

(A) I have seen

(B) that film last year

(C) but I do not remember its story

(D) No error

004. Chose the correct meaning of the phrase "To get into hot water":

(A) To be impatient

(B) To suffer huge financial loss

(C) To get into trouble

(D) To be in confused state of mind

005. Find out the word with correct spelling:

(A) Brassere (B) Brissiere

(C) Brasiiere (D) Brassiere

006. The value of 25-5 [2+3{2-2(5-3)+5}-10]÷4 is

(A) 5 (B) 23.25

(C) 23.75 (D) 25.75

007. If the sum of a number and its square is 182, what is the number?

(A) 12 (B) 13

(C) 28 (D) 91

008. The sum of the ages of a father and his son is 45 years. Five years ago, the product of their ages was 34. The ages of the son and the father are respectively:

(A) 6 and 39 (B) 7 and 38

(C) 9 and 36 (D) 11 and 34

009. A number, when 35 is subtracted from it, reduces to its 80%. What is four fifth of that number?

(A) 70 (B) 90

(C) 120 (D) 140

010. If the ratio of areas of two circles is 4:9 then the ratio of their circumstances will be:

(A) 3:2 (B) 2:3

(C) 4:9 (D) 9:4

011. Army is related to Soldier as Galaxy is related to:

(A) Planet (B) Satellite

(C) Meteor (D) Star

012. IGH:TRS::?:KIJ

(A) POQ (B) QOP

(C) OPQ (D) QPO

013. '1+2+3' stands for the 'the brave boy' '2+3+4' stands for 'brave boy swims' '1+2+4+5' stands for 'the brave girl swims'. What stand for 'brave'?

(A) 1 (B) 2

(C) 3 (D) 4

014. Manipulate the symbol and find the missing number.

If 3*6=18

4*7=22

9*1=20

then 5*2 =?

(A) 14 (B) 10

(C) 7 (D) 3

015. In a row of children, Kamal is sixth from the left and Appu is fourth from the right. When Kamal and Appu exchange positions, Appu becomes seventeenth from the right. Which will be Kamal's position from the left?

(A) Twentieth

(B) Nineteenth

(C) Twenty-first

(D) Seventh

016. If $A=\begin{bmatrix}3 & -3 & 4\\ 2 & -3 & 4\\ 0 & -1 & 1\end{bmatrix}$, then

(A) $A^2=A^{-1}$ (B) $A^3=A^{-1}$

(C) $A^4=A^{-1}$ (D) $A^5=A^{-1}$

where A^{-1} is the inverse matrix of A.

017. The rank of the matrix

$$A=\begin{bmatrix}1 & 1 & -1 & 1\\ -1 & 1 & -3 & -3\\ 1 & 0 & 1 & 2\\ 1 & -1 & 3 & 3\end{bmatrix}$$ is

(A) 1 (B) 2

(C) 3 (D) 4

018. If $A=\begin{bmatrix}1 & 0 & 0\\ 1 & 0 & 1\\ 0 & 1 & 0\end{bmatrix}$ then for every integer n ≥3

(A) $A^n=A^{n-2}+A^2-I$

(B) $A^n=A^{n-2}-A^2+I$

(C) $A^n=A^{n-3}+A^2-I$

(D) $A^n=A^{n-3}-A^2-I$

where I is the identity matrix of order 3.

019. $\lim_{x\to 0} x\sin\frac{1}{x}=$

(A) 0 (B) 1

(C) ∞ (D) $-\infty$

020. If $f(x)=\begin{cases}\dfrac{x\left(e^{\frac{1}{x}}-e^{\frac{1}{x}}\right)}{\left(e^{\frac{1}{x}}+e^{\frac{1}{x}}\right)}, x\neq 0\\ 0, x=0\end{cases}$, *then*

(A) f is continuous and derivable at $x=0$

(B) f is continuous but not derivable at $x=0$

(C) f is discontinuous at $x=0$

(D) f is derivable everywhere.

021. The sum of the serie

$1-\frac{1}{2^2}+\frac{1}{3^2}-\frac{1}{4^2}+\ldots.$, is equal to

(A) $\frac{\pi^2}{4}$ (B) $\frac{\pi^2}{6}$

(C) $\frac{\pi^2}{8}$ (D) $\frac{\pi^2}{12}$

022. The general solution of the partial differential equation

$\left(\frac{y-z}{yz}\right)\frac{\partial z}{\partial x}+\left(\frac{z-x}{zx}\right)\frac{\partial z}{\partial y}=\frac{x-y}{xy}$, is

(A) $\phi(xyz, x^2+y^2+z^2)=0$

(B) $\phi(xyz, xy+yz+zx)=0$

(C) $\phi(xyz, x+y+z)=0$

(D) $\phi(xyz, x^2y+y^2z+z^2x)=0$

023. A unit vector normal to the surface $x^3+y^3+3xyz=3$ at the point *(1,2,-1)* is

(A) $\frac{\hat{i}+3\hat{j}+2\hat{k}}{\sqrt{14}}$ (B) $\frac{-\hat{i}+3\hat{j}+2\hat{k}}{\sqrt{14}}$

(C) $\frac{\hat{i}+2\hat{j}+3\hat{k}}{\sqrt{14}}$ (D) $\frac{-\hat{i}+2\hat{j}+3\hat{k}}{\sqrt{14}}$

024. The vector field defined by

$\vec{F} = (x + 2y + az)\hat{i} + (bx - 3y - z)\hat{j} + (4x + cy + 2z)\hat{k}$

is irrotational, if

(A) $a=4, b=2, c=-1$

(B) $a=4, b=-2, c=1$

(C) $a=1, b=2, c=4$

(D) $a=-1, b=4, c=2.$

025. The value of $\oint_c \left(x^2 + xy\right)dx + \left(x^2 + y^2\right)dy$ where C is the square formed by the lines $y = \pm 1, x = \pm 1$, is equal to

(A) 2π (B) 2

(C) 1 (D) 0

026. The only solution of the differential equation $x\frac{dy}{dx} - \frac{1}{2}y = x + 1$ for which x and y can attain the value unity is given by

(A) $y = 2x - \sqrt{x} + 2$

(B) $y = 2x + \sqrt{x} + 2$

(C) $y = 2x - \sqrt{x} - 2$

(D) $y = 2x + \sqrt{x} - 1$

027. The Laplace transform of $e^x x^{\frac{1}{2}}$ is

(A) $\frac{x}{\sqrt{s-1}}$ (B) $\frac{\sqrt{\pi}}{\sqrt{s-1}}$

(C) $\frac{\sqrt{\pi}}{\sqrt{s+1}}$ (D) $\frac{\pi}{\sqrt{s+1}}$

028. A die is tossed thrice. A success is getting *1* or *6* on a toss. Then the mean of the number of success is

(A) $\frac{1}{2}$ (B) $\frac{1}{3}$

(C) $\frac{2}{3}$ (D) 1

029. A manufacturer knows that the condensers he makes contain on an average 1% of defectives. He packs them in boxes of 100. The probability that a box picked at random will contain 4 or more faulty condensers is

(A) $1 - \frac{8}{3e}$ (B) $1 - \frac{3}{8e}$

(C) $1 - \frac{4}{3e}$ (D) $1 - \frac{3}{4e}$

030. The order of convergence of Newton Raphson method is

(A) 0 (B) 1

(C) 2 (D) 3

M. Tech Electronic & Communication

031. In semiconductors at a room temperature

(A) The valence band is completely filled and the conduction band is partially filled

(B) The valence band is completely filled

(C) The conduction band is completely empty

(D) The valence band is partially empty and the conduction band is partially filled

032. The emitter of the transistor is generally doped the heaviest because it

(A) has to dissipate maximum power

(B) is the first region of the transistor

(C) must possess low resistance

(D) has to supply the charge carriers

033. The Schottky diode is used

(A) in high-power circuits.

(B) in circuits requiring negative resistance.

(C) in very fast-switching circuits.

(D) in power supply rectifiers.

034. Which of the following parameter describes the best movement of the electrons inside a semiconductor?

(A) Velocity gradient

(B) Mobility

(C) Diffusion

(D) Density gradient

035. Calculate the diffusion constant for the electrons when the mobility of the electrons is 325cm^2/V-s and temperature is 300K?

(A) 0.85 m^2/s

(B) 0.084 m^2/s

(C) 0.58 m^2/s

(D) 0.95 m^2/s

036. If the energy gap of a semiconductor is 1.1 e V it would be:

(A) Opaque to the visible light

(B) Transparent to the visible light

(C) Transparent to the ultraviolet radiation

(D) None of the above

037. Silicon oxide is patterned on a substrate using:

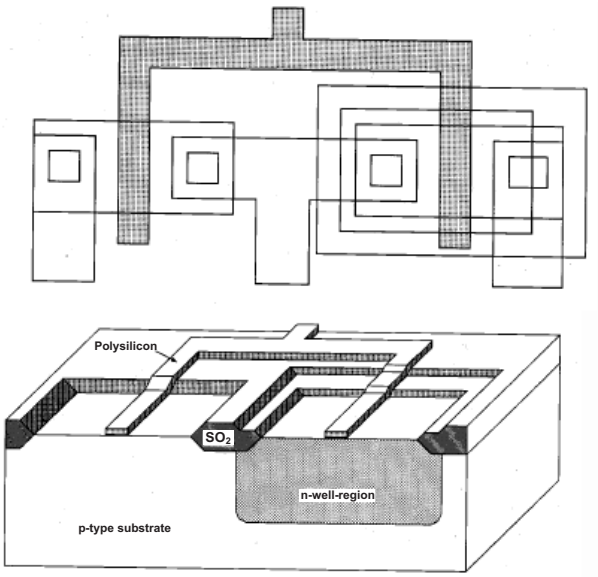
(A) Physical lithography

(B) Photolithography

(C) Chemical lithography

(D) Mechanical lithography

038. The process involved in growing the shaded region is:



(A) Chemical vapor deposition (CVD)

(B) Sputtering and patterned by etching

(C) Chemical vapor deposition (CVD) and patterned by HF acid etching

(D) Chemical vapor deposition (CVD) and patterned by dry (plasma) etching

039. Speed power product is measured as the product of

(A) gate switching delay and gate power dissipation

(B) gate switching delay and gate power absorption

(C) gate switching delay and net gate power

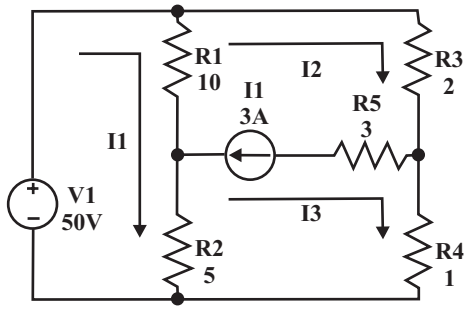
(D) gate power dissipation and absorption

040. Calculate the charge density for the current density given 20sinxi + ycoszj at the origin.

(A) 20t (B) 21t

(C) 19t (D) -20t

041. Find the current I_1 in the circuit shown below.



(A) 8 (B) -8

(C) 9 (D) -9

042. If the roots of an equation are complex conjugate, then the response will be?

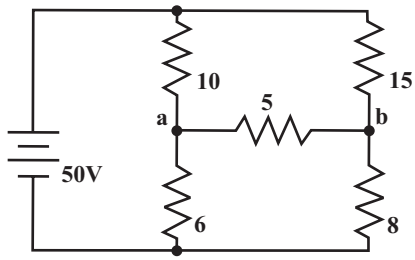
(A) over damped

(B) critically damped

(C) damped

(D) under damped

043. Determine the equivalent Thevenin's voltage between terminals 'a' and 'b' in the circuit shown below:



(A) 0.7 (B) 1.7

(C) 2.7 (D) 3.7

044. The reactive power equation (P_r) is?

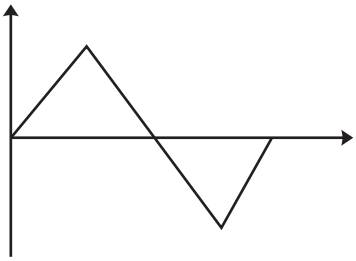
(A) I_{eff}^2 (ωL)sin2(ωt+θ)

(B) I_{eff}^2 (ωL)cos2(ωt+θ)

(C) I_{eff}^2 (ωL)sin(ωt+θ)

(D) I_{eff}^2 (ωL)cos(ωt+θ)

045. The total period of the function shown in the figure is 4 sec and the amplitude is 10. Find the function f_1 (t) from t = 0 to 1 in terms of unit step function.



Find the function f_2 (t) from the time t = 1 to 3 sec.

(A) (-10t+20) [u (t-1) +u (t-3)]

(B) (-10t+20) [u (t-1) – u (t-3)]

(C) (-10t-20) [u (t-1) + u (t-3)]

(D) (-10t-20) [u (t-1) – u (t-3)]

046. What are fourier coefficients?

(A) The terms that are present in a fourier series

(B) The terms that are obtained through fourier series

(C) The terms which consist of the fourier series along with their sine or cosine values

(D) The terms which are of resemblance to fourier transform in a fourier series are called fourier series coefficients

047. If n tends to infinity, is the accumulator function an unstable one?

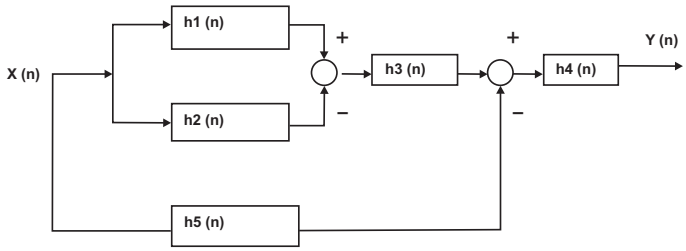
(A) The function is marginally stable

(B) The function is unstable

(C) The function is stable

(D) None of the mentioned

048. The overall impulse response of the system is given by _____



(A) h[n]=(h1[n]-h2[n])*h3[n]+h5[n]*h4[n]

(B) h[n] = (((h1[n]-h2[n]) * h3[n]) + h5[n]) * h4[n]

(C) h[n] = (((h1[n]-h2[n]) * h3[n])-h5[n]) * h4[n]

(D) h[n] = (((h1[n]-h2[n]) * -h3[n])-h5[n]) * h4[n]

049. Find the convolution of x1[n] = {1, 2, 3, 4} and x2[n] = {2, 1, 2, 1}.

(A) Y[n] = {14, 10, 14, 10}

(B) Y [n] = {14, 16, 14, 16}

(C) Y [n] = {14, 16, -14, -16}

(D) Y [n] = {14, -16, -14, 16}

050. What are the values of an and bn when the signal is even?

(A) a_n=0 and b_n=0

(B) a_n=0 and b_n=4/T$\int$x(t)cos(nwt)dt

(C) a_n=4/T$\int$x(t)cos(nwt)dt and b_n=0

(D) a_n=4/T$\int$x(t)sin(nwt)dt and b_n=4/T$\int$x(t) cos(nwt)dt

051. Transistor in power amplifier is

(A) An active device

(B) A passive device

(C) An op-amp

(D) A voltage generating device

052. Clapp oscillator is an

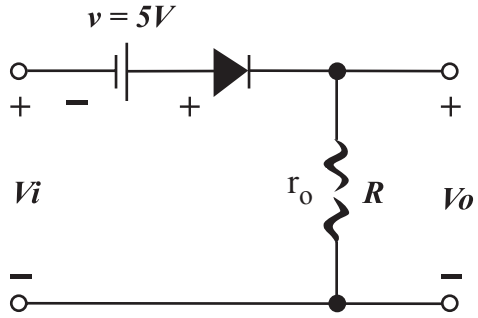
(A) LC oscillator

(B) RC oscillator

(C) RL oscillator

(D) Crystal oscillator

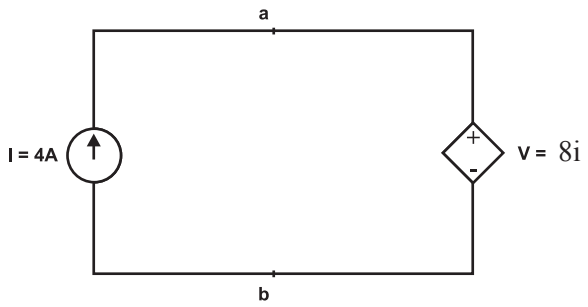
053. For a sinusoidal input of 20 V_{peak} to the given circuit, what is the peak value of the output waveform?



(A) 20 V (B) 25 V

(C) 0 V (D) -25 V

054. The above circuit is valid.



(A) False (B) True

(C) Both (D) Neither of a) nor b)

055. The circuits of an inverting and Non-Inverting amplifying comprises of _____ and _____ number of resistors.

(A) 2, 3 (B) 3, 2

(C) 2, 2 (D) 3, 3

056. In a P^+N junction diode under reverse bias, the magnitude of electric field is maximum at

(A) The edge of the depletion region on p-side

(B) The edge of the depletion region on n-side

(C) The P^+N side

(D) The centre of the depletion region on the N side

057. For a forward biased PN junction diode, the sequence of the events that best describes the mechanism of the current flow is:

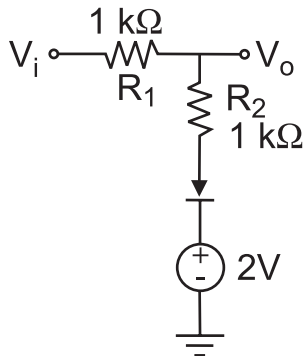
(A) Injection and subsequent diffusion and recombination of the minority carriers

(B) Injection and subsequent drift and generation of minority carriers

(C) Extraction and subsequent diffusion and generation of minority carriers

(D) Extraction and subsequent drift and recombination of minority carriers

058. The diode in the circuit shown, if $V_{on} = 0.7$ volts but it is ideal otherwise. If $V_i = 5\sin(\omega t)$ volts, the minimum and maximum values of V_o (in volts) are, respectively,



(A) -5 & 2.7 (B) 2.7 & 5

(C) -5 & 3.85 (D) 1.3 & 5

059. A 555 timer in monostable application mode can be used for

(A) Pulse position modulation

(B) Frequency shift keying

(C) Digital phase detector

(D) Speed control and measurement

060. If the input to a differentiating circuit is a saw-tooth wave, then output will be:

(A) square (B) triangular

(C) sine (D) rectangular

061. While performing read operation, one must take care that much current should not be

(A) sourced from data lines

(B) sinked from data lines

(C) sourced or sinked from data lines

(D) sinked from address lines

062. In memory-mapped scheme, the devices are viewed as

(A) distinct I/O devices

(B) memory locations

(C) only input devices

(D) only output devices

063. Consider the following minterm expression for F:

$F(P, Q, R, S) = \sum (0, 2, 5, 7, 8, 10, 13, 15)$

The minterms 2, 7, 8 and 13 are 'do not care' terms. The minimal sum-of-products form for F is:

(A) $Q\bar{S} + \bar{Q}S$

(B) $\bar{Q}\bar{S} + QS$

(C) $\bar{Q}\bar{R}\bar{S} + \bar{Q}R\bar{S} + Q\bar{R}\bar{S} + QRS$

(D) $\bar{P}\bar{Q}\bar{S} + \bar{P}QS + PQS + P\bar{Q}\bar{S}$

064. Consider the equation: $(7526)_8 - (Y)_8 = (4364)_8$, where $(X)_N$ stands for X to the base N. Find Y.

(A) 1634 (B) 1737

(C) 3162 (D) 3142

065. How many 3-to-8 line decoders with an enable input are needed to construct a 6-to-64 line decoder without using any other logic gates?

(A) 7 (B) 8

(C) 9 (D) 10

066. NAND circuits are contained in a 7400 NAND IC.

(A) 1 (B) 2

(C) 8 (D) 4

067. The primary use for Gray code is

(A) Coded representation of a shaft's mechanical position

(B) Turning on/off software switches

(C) To represent the correct ASCII code to indicate the angular position of a shaft on rotating machinery

(D) To convert the angular position of a shaft on rotating machinery into hexadecimal code

068. Data can be changed from spatial code to temporal code and vice-versa by using:

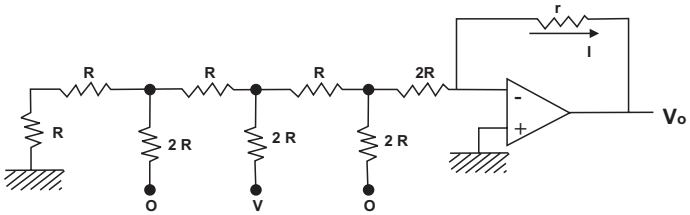
(A) ADCs and DACs

(B) Shifts registers

(C) Synchronous Counters

(D) Timers

069. The current I flowing through resistance 'r' in the circuit shown is:



(A) -V/12R (B) V/12R

(C) V/6R (D) V/3R

070. A switching-tailing counter is made by using a single D flip flop. The results circuit is a:

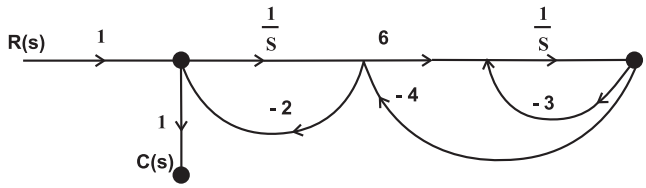
(A) SR Flip flop

(B) JK Flip flop

(C) D Flip Flop

(D) T Flip Flop

071. The signal flow graph of a system is shown in figure:



(A) $\frac{6}{S^2 + 29s + 6}$

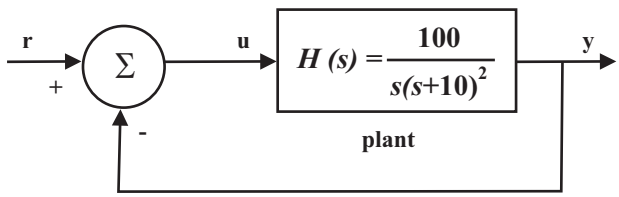
(B) $\frac{6s}{S^2 + 29s + 6}$

(C) $\frac{S(S+2)}{S^2 + 29s + 6}$

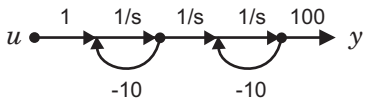
(C) $\frac{S(S+27)}{S^2 + 29s + 6}$

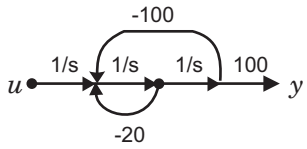
Common data for question 42 & 43

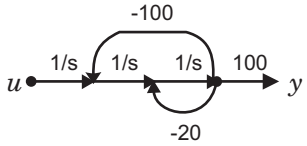
The input-output transfer function of a plant $H(s) = 100/s(s+10)^2$. The plant is placed in a unity negative feedback configuration as shown in figure below.

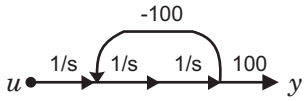


072. The signal flow graph that DOES NOT model the plant transfer function H(s) is:

(A) 

(B) 

(C) 

(D) 

073. The gain margin of the system under closed loop unity negative feedback is:

(A) 0 dB (B) 20 dB

(C) 26 dB (D) 46 dB

074. The open loop transfer function of a unity feedback system is

$G(s) = K/[s(s^2 + s + 2)(s + 3)]$.

The range of K for which the system is stable is:

(A) $(21/44) > K > 0$

(B) $13 > K > 0$

(C) $(21/4) < K < \infty$

(D) $-6 < K < \infty$

075. The feedback system shown below oscillates at 2rad/sec, when

(A) K = 2 and a = 0.75

(B) K = 3 and a = 0.75

(C) K = 4 and a = 0.50

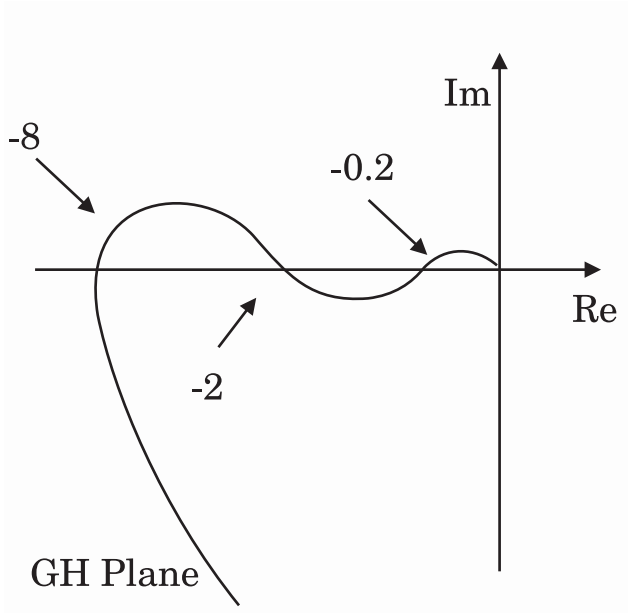
(D) K = 2 and a = 0.50

076. The open loop transfer function of a unity gain feedback control system is given by $G(s) = K/[(s+1)(s+2)]$. The gain margin of the system in dB is given by:

(A) 0 (B) 1

(C) 20 (D) ∞

077. The polar diagram of a conditionally stable system for open loop gain K=1 is shown in figure. The open loop transfer function of the system is known to be stable. The closed loop system is stable for:



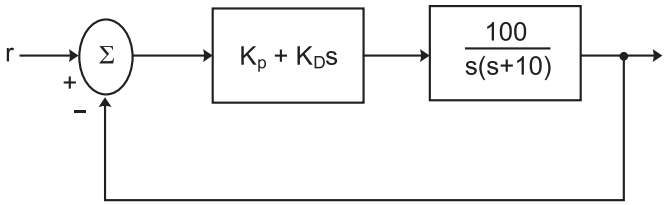
(A) $K < 5$ and $½ < K < 1/8$

(B) $K < 1/8$ and $½ < K < 5$

(C) $K < 1/8$ and $5 < K$

(D) $K > 1/8$ and $K < 5$

078. A control system with a PD controller is shown in the figure:



If the velocity error constant K_v=1000 and the damping ration ξ=0.5, then the values of K_p and K_D are:

(A) $K_p = 100, K_D$=0.09

(B) $K_p = 100, K_D$=0.9

(C) $K_p = 10, K_D$=0.09

(D) $K_p = 10, K_D$=0.9

079. What is the effect of phase lag compensation on the performance of a servo system?

(A) For a given relative stability, the velocity constant is increased

(B) For a given relative stability, the velocity constant is decreased

(C) The bandwidth of the system is increased

(D) The time response is made faster

080. With regard to the filtering capacity the lead compensator and lag compensator are respectively:

(A) Low pass and high pass filter

(B) High pass and low pass filter

(C) Both high pass filter

(D) Both low pass filters

081. In commercial TV transmission in India, picture and speech signals are modulated respectively (Picture) (Speech)

(A) VSB and VSB

(B) VSB and SSB

(C) VSB and FM

(D) FM and VSB

082. In a double side-band (DSB) full carrier AM transmission system, if the modulation index is doubled, then the ratio of total sideband power to the carrier power increases by a factor of _____.

(A) 4

(B) 8

(C) 2

(D) 16

083. Super heterodyne receivers

(A) Have better sensitivity

(B) Have high selectivity

(C) Need extra circuitry for frequency conversion

(D) All of the above

084. The modulation technique that uses the minimum channel bandwidth and transmitted power is

(A) FM (B) DSB-SC

(C) SSB (D) VSB

085. A fair is tossed repeatedly until a 'Head' appears for the first time. Let L be the number of tosses to get this first 'Head'. The entropy H(L) in bits is _____

(A) ½ (B) 1/4

(C) 2 (D) 4

086. In a digital communication system, transmission of successive bits through a noisy channel are assumed to be independent events with error probability p. The probability of at most one error in the transmission of an 8-bit sequence is

(A) $7(1-p)/+p/8$

(B) $(1-p)^8 + 8p\,(1-p)^7$

(C) $(1-p)^8 + (1-p)^7$

(D) $(1-p)^8 + p\,(1-p)^7$

087. Example of continuous wave analog modulation is

(A) PCM (B) DM

(C) PAM (D) AM

088. Assertion (A): Coherent FSK system is preferred over non-coherent FSK.

Reason(R): Coherent FSK requires less power than non-coherent FSK.

(A) Both A and R are true and R is the correct explanation of A

(B) Both A and R are true but R is not the correct explanation of A

(C) A is true but R is false

(D) A is false but R is true

089. The maximum number of quantized amplitude levels, in a 3-digit ternary PCM systems van be used to represent is:

(A) 8 (B) 9

(C) 27 (D) 81

090. The optimum threshold to achieve minimum bit error rate (BER) is

(A) 1/2 (B) 4/5

(C) 1 (D) 3/2

091. A transmission line is distortion less if

(A) $RL = 1 / RC$

(B) $RL = GC$

(C) $RL = LC$

(D) $RL = RC$

092. Find the Cartesian coordinates of $B(4,25^o,120^o)$:

(A) (0.845, 1.462, 3.625)

(B) (-0.845, 1.462, 3.625)

(C) (-8.45, 2.462, 6.325)

(D) (8.45, 2.462, 6.325)

093. Which among the following statements is/are precise in accordance to distortionless line?

A. A lossless line is also a distortionless line

B. A distortionless line is not necessarily a lossless line

(A) A is true & B is false

(B) A is false & B is true

(C) Both A & B are true

(D) Both A & B are false

094. Which among the below given statements are correct in accordance to the properties of a conductor?

A. The static electric field intensity at the surface of conductor is directed parallel to the surface.

B. The static electric field intensity at the surface of conductor is directed perpendicular to the surface.

(A) Only A is correct

(B) Only B is correct

(C) Both A & B are correct

(D) Both A & B are incorrect

095. In the medium of free space, the divergence of the electric flux density will be

(A) 1 (B) 0

(C) -1 (D) Infinity

096. Find the power of an EM wave, given that the cross product of the E and H component is 2 + 3j.

(A) 2 (B) 8

(C) 4 (D) 1

097. $\int\int (\nabla \times P)$. Ds, Where P is a vector, is equal to

(A) $\oint P.dl$

(B) $\oint \nabla \times \nabla \times P.\, dl$

(C) $\oint \nabla \times P.\, dl$

(D) $\int\int\int \nabla .\, P\, d$

098. The electric field on the surface of a perfect conductor is 2 V/m. The conductor is immersed in water $\varepsilon = 80\ \varepsilon_0$. The surface charge density on the conductor is

(A) 0 $C/m2$

(B) 2 $C/\ m2$

(C) $1.8 \times 10^{-11}\ C/\ m2$

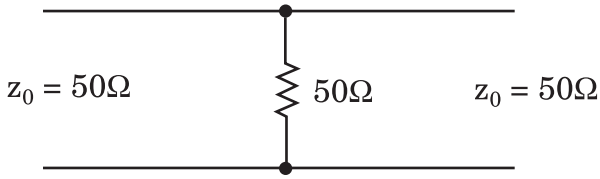
(D) $1.41 \times 10^{-9}\ C/\ m2$

099. The capacitance per unit length and the characteristic impedance of a lossless transmission line are C and Z_0 respectively. The velocity of a travelling wave on the transmission line is

(A) Z_0C (B) $1/(Z_0C)$

(C) Z_0/C (D) C/Z_0

100. A load of 50Ω is connected in shunt in a 2 – wire transmission line of Z_0 = 50Ω as shown in the figure. The 2 – port scattering parameter (s – matrix) of the shunt element



(A) $\begin{bmatrix} -\frac{1}{2} & \frac{1}{2} \\ \frac{1}{2} & -\frac{1}{2} \end{bmatrix}$ (B) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

(C) $\begin{bmatrix} -\frac{1}{3} & \frac{2}{3} \\ \frac{2}{3} & -\frac{1}{3} \end{bmatrix}$ (D) $\begin{bmatrix} \frac{1}{4} & -\frac{3}{4} \\ \frac{1}{2} & \frac{1}{4} \end{bmatrix}$

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