NTA UGC NET

ELECTRONIC SCIENCE

SOLVED SAMPLE PAPER

(English Medium)

* **DETAILED SOLUTIONS**
* **NEW SYLLABUS**
* **NEW PATTERN**

MOCK TEST PAPER

- **PAPER - II** *This paper contains 100 objective type questions.*

  Each question carries 2 marks.

  Attempt all the questions.

- *Pattern of questions* : *MCQs*
- *Total marks* : *200*
- *Duration of test* : *2 Hours*

---

1. In counter, each flip flop will toggle when its clock receives a

(1) Zero edge clock (2) Negative edge clock

(3) Positive edge clock (4) None of these

2. The process of reducing quantity of data is

(1) Data handling capacity (2) Data reduction

(3) Data processing (4) Programme

3. The dynamic properties of sample and hold circuit are important in the overall performance of

(1) ADC (2) DAC

(3) Signal conversion system (4) Sample and hold circuit

4. Consider the following interrupt

i. RST 6.5   ii. RST 7.5   iii. RST 5.5   iv. INTR

The correct descending order of these interrupts according to priority is

(1) ii, i, iii, iv (2) iv, ii, i, iii

(3) iv, iii, i, ii (4) ii, i, iii, iv

5. Consider the different typical services

i. Government

ii. Word wide telegraphy

iii. Broadcasting

iv. Satellite communication

The correct increasing order of these services according to frequency band used for those is

(1) i, iv, ii, iii   (2) ii, iii, iv, i

(3) iii, ii, i, iv   (4) ii, iv, i, iii

6. Match List-I (Name of the circuit) with List-II (Characteristics) and select the correct answer using the codes given below the lists :

List-I	**List-II**
A. Tunnel diode oscillator	1. Produces high current pulses of short
B. UJT oscillator	2. An LC oscillator used for generation of sine wave at RF
C. Hartley oscillator	3. A negative resistance oscillator for MW frequency
D. Blocking	4. Uses negative oscillator resistance property for the Generation of sawtooth waveform

Codes :

A B C D

(1) A-3 B-2 C-1 D-4   (2) A-1 B-2 C-4 D-3

(3) A-3 B-4 C-2 D-1   (4) A-4 B-3 C-1 D-2

7. Match the list of GROUP-I with the list of GROUP-II for a JFET–

GROUP-i	**GROUP-ii**
(A) Pinch–off voltage decrease	(i) If channel doping reduced.
(B) Transconductance increases	(ii) If channel length increased.
(C) Transit time of carriers in channel is reduced	(iii) If channel conductivity increased.
	(iv) If channel length reduced.
	(v) If gate area reduced.

(1) A – (i), B – (iv), C–(iii)

(2) A – (i), B – (iii), C–(v)

(3) A – (i), B – (iv), C – (v)

(4) A – (ii), B – (iv), C – (v).

8. Match **List I** and **List II**:

List I	List II
(A) Multiplexer	(1) Sequential memory
(B) De-Multiplexer	(2) Converts decimal number to binary
(C) Shift register	(3) Data selector
(D) Encoder	(4) Routes out many data output with single input

(1) A – 3 B – 4 C – 1 D – 1   (2) A – 4 B – 3 C – 1 D – 2

(3) A – 3 B – 4 C – 2 D – 1   (4) A – 1 B – 2 C – 3 D – 4

9. Match **List** (Modulation system) and **List II** () Figure of merit

List I	List II
(A) AM-DSB FC	(1) 2
(B) WBFM	(2) 1
(C) PCM	(3) 3 m f
(D) AM-DSB	(4) 2

(1) A – 1 B – 2 C – 3 D – 4   (2) A – 2 B – 1 C – 4 D – 3

(3) A – 2 B – 3 C – 4 D – 1   (4) A – 4 B – 3 C – 2 D – 1

10. Match **LIST–I** and **LIST – II** and select the answer using the codes given:

LIST – I (Antennas)	LIST– II (Application)
A. Cass grain antenna	1. Large Bandwidth
B. Yagi antenna	2. Direction Finding
C. Parabolic reflector antenna	3. Radar
D. Loop antenna	4. Directional transmission

Codes

   A B C D

(1) A-1 B-4 C-2 D-3

(2) A-3 B-1 C-4 D-2

(3) A-2 B-4 C-3 D-1

(4) A-3 B-2 C-4 D-1

11. The logic expression for the output of the circuit shown in the figure is

(A) $f = \bar{A}\bar{B} + AB$

(B) $f = \bar{A}B + A\bar{B}$

(C) $f = \bar{A}B$

(D) $f = A\bar{B}$

12. Which of the given statement is false for serial adder?

(1) Uses shift Registers

(2) Equal to the number of bits in the binary numbers

(3) Sequential circuit

(4) Consists of a full - adder & flip - flop.

13. Convert $(111\ 0110011111010)_2$ to decimal.

(1) 66006_{10}

(2) 60066_{10}

(3) 60666_{10}

(4) 66606_{10}

14. Identify the function for the given minimized form.

$F(A, B, C) = PM(0, 3, 5)$

(1) $F = \left(\bar{A}\,\bar{B}\,\bar{C}\right) + \left(\bar{A}\,B\,C\right) + \left(A\,\bar{B}\,C\right)$

(2) $F = \left(A\,B\,C\right) + \left(A\,\bar{B}\,\bar{C}\right) + \left(\bar{A}\,B\,\bar{C}\right)$

(3) $F = \left(\bar{A} + \bar{B} + \bar{C}\right) + \left(\bar{A} + B + C\right) + \left(A + \bar{B} + C\right)$

(4) $F = \left(A + B + c\right).\left(A + \bar{B} + \bar{C}\right).\left(\bar{A} + B + \bar{C}\right)$

15. What will happen after execution of the following 'C' fragment?

{ double d ;Scanf (" % C" , d) ;

(1) Compilation error

(2) Run time error

(3) Logical error

(4) No error.

16. The following loop

while (printf ("%d", printf ("az")))

printf("by:);

(1) prints azbybybyby...

(2) prints azbyazbyazbyazby...

(3) results in a syntax error

(4) None of the above

17. Consider the following program fragment if (a > b) printf ("a < b");

else printf ("a < = b"); a < = b will be printed if

(1) a > b   (2) a < b

(3) a = = b   (4) All of these

18. The body of the following for loop

fpr (putchar ('a'); putchar (0); putchar ('c'))

putchar ('b');

will be executed

(1) 0 times

(2) 1 time

(3) Infinitely many times

(4) Will not be executed because of syntax error

19. If storage class is missing in the array definition, by definition, by default it will be

taken to be

(1) automatic

(2) external

(3) static

(4) either automatic or external depending on the place of occurrence

20. Consider the following program fragment.

procedure exchange (A: integer, B: integer)

temp : integer)

end;

begin

M : = 2; X [M] : = 4;

Exchange (M, X[M]); write (M, x[2]);

end If the parameters are passed by value, the output will be

(1) unpredictable   (2) 2, 4

(3) 4, 2   (4) 2, 2

21. 4, 2 will be the output of the previous question if the parameters are passed by

(1) Reference   (2) Name

(3) Value   (4) None of the above

22. If the parameters are passed by name, the output will be

(1) 2, 2   (2) 4, 4   (3) 2, 4   (4) 4, 2

23. Choose the correct statement.

(1) Step-wise refinement uses top-down methodology

(2) Step=wise refinement uses bottom-up methodology

(3) Use of library routines faciliate bottom=up methodology

(4) A and C both

24. Which of the following logic families is well suited for high-speed operation?

(1) TTL   (2) ECL

(3) MOS   (4) CMOS

25. The following arrangement of JK flip-flops does the functions of a
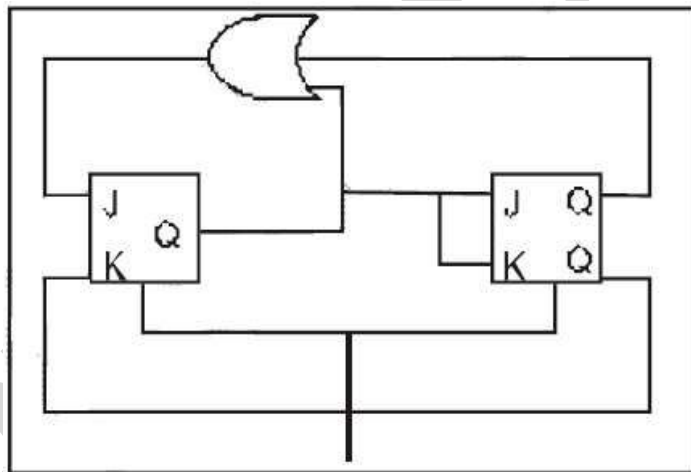
(1) A Shift register   (2) Mod-3 counter

(3) Model-2 counter   (4) None of the above

26. If many functions have the same name, which of the following information, if present, will be used by the compiler to invoke the correct function to be used?

(1) The operator   (2) The return value of the function

(3) Function signature   (4) None of the above

27. Choose the correct remarks.

(1) C++ allows any operator to be overloaded

(2) Some of the existing operators cannot be overloaded

(3) Operator precedenece cannnot be changed.

(4) All of the above.

28. If the function chg is coded as

int chg (const int ex)

{

x = 10;

return (11);

}

then

(1) it results in compile-time error

(2) it results in run time error

(3) it prints 112

(4) it prints 1110

29. If an induction type energy meter runs fast, it can be slowed down by adjusting the

(1) lag   (2) Light load

(3) position of braking magnet and making it move closer to the centre of the disc

(4) position of braking magnet and making it move away from the centre of the disc

30. Which one of the following statements is NOT correct?

(1) If everything else is equal, then a 10 bit digital ramp ADC. will have a better resolution but a longer conversion time than an 8 bit ADC

(2) The conversion time for a successive approximation increase with the increase in input voltage

(3) A flash ADC does not contain a DAC

(4) VCO is the main component of a voltage to frequency ADC

31. For a periodic function the spectral density and the auto correlation functions form

(1) Fourier transforms pair   (2) Laplace transforms pair

(3) Hubert's transform pair   (4) Z-transform pair

32. Match List I with List II and select the correct answer using the codes given below the lists:

List I	List II
A. Collector modulation	1. FM generation
B. Phase shift method	2. DSB generation
C. Balanced modulator	3. AM generation
D. Amplitude limiter	4. SSB generation

Codes:

  A B C D

(1) A-3 B-4 C-1 D-2

(2) A-4 B-3 C-1 D-2

(3) A-3 B-4 C-2 D-1

(4) A-4 B-3 C-2 D-1

33. With a real-time constraint, the transmission bandwidth needed for a digital signal with r symbols per second is equal to or greater than

(1) 1/r   (2) r/2   (3) r   (4) 2r

34. A dc cumulatively compounded motor delivers rated load torque at rated speed, If the series field is short-circuited, then the armature current and speed will

(1) Both decrease

(2) Both increase

(3) Increase and decrease respectively

(4) Decrease and increase respectively

35. **Assertion (A) :** The output voltage swing of a difference amplifying can be increased by using a current mirror circuit.

Reason (R) : The current mirror circuit has low static resistance and high dynamic resistance.

Codes:

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

(2) Both A and R are true but R is not a correct explanation of A.

(3) A is true but R is False.

(4) A is False but R is true.

36. **Assertion A**: The part of the root locus on the real axis is not dependent upon the poles and zeros which are not on the real axis.

Reason R: Poles and zeros which are not on the real axis always occur in conjugate pairs.

Codes:

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

(2) Both A and R are true but R is not a correct explanation of A.

(3) A is true but R is False.

(4) A is False but R is true.

37. A minimum phase system has gain margin of 8 dB and a phase margin of 21°.

Assertion A : The system is stable

Reason R : For a minimum phase system, both phase margin and gain margin must be positive for the system to be stable.

Codes:

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

(2) Both A and R are true but R is not a correct explanation of A.

(3) A is true but R is False.

(4) A is False but R is true.

38. **Assertion A :** Conductors do not permit propagation of waves more than a short distance into the conductor at microwave frequencies

Reason R: The relaxation time constant for conductors is much smaller than the period of centimetric EM wave.

Codes:

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

(2) Both A and R are true but R is not a correct explanation of A.

(3) A is true but R is False.

(4) A is False but R is true.

39. Which of these cannot be considered as an element of Multimedia computer

(1) CD ROM   (2) Speakers

(3) Microphone   (4) Network card

40. Which of the following check the syntactic correctness of a source program:

(1) Interpreter   (2) Compiler

(3) Interpreter and compiler   (4) None of the above

41. Thermal noise power of a resistor depends upon

(1) Its resi stance value   (2) Noise temperature

(3) Bandwidth   (4) Ambient temperature

42. Consider the following statements relating to a laser beam

1. It is highly monochromatic

2. Has high angular divergence

3. It is produced by spontaneous emission

4. It is used in communication wave

5. It is an electro magnetic wave

of these statements

(1) 1, 4, and 5 are correct   (2) 4 and 5 are correct

(3) 1, 2 and 3 are correct   (4) 2, 3 and 4 are correct

43. Figure of merit is always unity in

(1) SSB-SC   (2) AM   (3) FM   (4) All of these

44. The choice of the product RC in an envelope detector using a diode and R-C circuit is governed by

(1) Both the lowest and the highest modulation frequencies

(2) Only the depth of modulation

(3) The depth of modulation and the lowest modulation frequency

(4) The depth of modulation and the highest modulation frequency

45. The operation of an inverter fed induction motor can be shifted from motoring to regenerate braking by

(1) Reversing phase sequence

(2) Reducing inverter voltage

(3) Decreasing inverter frequency

(4) Increasing inverter frequency

46. In a hollow rectangular waveguide, phase velocity is

(1) Increases with increasing in frequency

(2) Decreases with increase in frequency

(3) Independent of frequency

(4) Will vary with frequency in a given range

47. In the equivalent circuit of a transmission line, if we replace the equivalent T network by p network then

(1) Line equations will change

(2) Line equations remain unchanged

(3) Value of propagation constant will change

(4) Value of circuit impedance

48. The Q factor of a microwave resonant cavity is -

1. Proportional to volume of the cavity

2. Proportional to the total inner surface area

3. Proportional to frequency of the wave

4. Inversely proportional to metallic resistance of guide walls

The correct statements are-

(1) 1 and 2 only   (2) 2 and 3 only

(3) 1, 2 and 3   (4) 1, 3 and 4

49. The built in potential in semiconductor is

(1) Dependent to doping

(2) Independent of doping

(3) Partially dependent of doping

(4) None of the above

50. An avalanche photo diode works on

(1) High Forward Bias

(2) High Forward Bias and impact ionization

(3) High Reverse Bias

(4) All of the above

51. TTL circuits with active pull up are preferred because of their stability for

(1) Wired - AND operation

(2) Wired - or operation

(3) Bus operated system

(4) Reasonable dissipation and speed of operation

52. Radiation efficiency of an antenna is defined as the ratio of

(1) Total power radiated by an antenna to the net power accepted by the antenna from the connected transmitter

(2) The frequency at which minimum power is radiated to the frequency at which maximum power is radiated

(3) Total power accepted from the transmitter to total power generated by the transmitter

(4) Power in main lobe to that in the side lobe

53. Compared to transistor and FETs the speed of switching in a Schottky diode is

(1) Higher   (2) Lower

(3) Same   (4) Can't say

54. Introducing a resistor in the emitter of a common emitter amplifier stabilizes the d.c. operating point against variations in

(1) Only temperature   (2) Only b of transistor

(3) Both temperature and b   (4) None of these

55. In the design of digital logic families there is a trade off between

(1) Propagation delay and power dissipation

(2) Switching time and fan out

(3) Fan out and power dissipation

(4) Switching time and noise margin

56. The use of non-uniform quantization leads to

(1) Reduction in transmission bandwidth

(2) Increase in maximum SNR

(3) Increase in SNR for low level signals

(4) Simplification of quantizations process

57. A TTL totem-pole circuit is designed so that the output transistors

(1) Are always on together

(2) Provide phase splitting

(3) Provide voltage regulation

(4) Are never on together

58. To operate correctly, starting of a ring counter requires

(1) Clearing all the flip-flops

(2) Presetting one flip-flop and clearing all the others

(3) Clearing one flip-flop and presetting all the others

(4) Presetting all the flip-flops

59. The correct order of precedence from highest to lowest is:

(1) ++ ( ) * + < =   (2) ++ * - > && ==

(3) && < ++ < * !   (4) ++ * + < && =

60. DOS allows division of disk space into different portions called PARTITIONS.

(1) True   (2) False

(3) Sometime true   (4) Can't be said

61. ATTRIB is an internal DOD Command.

(1) True   (2) False

(3) It is not DOS command   (4) It is external DOS command

62. The most commonly used standard data code to represent alphabetical, numerical and punctuation characters used in electronic data processing system is called

(1) ASCII   (2). EBCDIC   (3). BCD   (4) All of above

63. For x = 9 , y = 5 , z = 3 the answer of if (x > y) && (y < z) statement will be.

(1) True   (2) False   (3) 5   (4) 2

64. Indicate which is not the characteristics of algorithm.

(1) Input   (2) Effectiveness

(3) Infiniteness   (4) None of the above

65. The symbol used to add description comment to the flow chart is

(1) INPUT symbol   (2) START symbol

(3) PROCESSING symbol   (4) ANNOTATION symbol

66. A derived data type is a combination of other already known types.

(1) True   (2) False

(3) Partially true   (4) None of the above

67. Which of the following is basic data type?

(1) Array   (2) Character   (3) Structure   (4) Union

68. a << 1 is equivalent to

(1) Multiplying a by 2   (2) Dividing a by 2

(3) Adding 2 to a   (4) None of the above

69. Assume an unsigned integer occupies 1 byte. Let myVar be an unsigned integer. Then myVar << 1 multiplies myVar by 2 if it is not greater than

(1) 127   (2) 255   (3) 256   (4) 128

70. In a certain machine, the sum of an integer and its 1's complement is 220 – 1. Then size of (int), in bits, will be

(1) 16   (2) 32

(3) unpredictable   (4) None of the above

71. The for loop

for (i = 0; 1 < 10; ++i)

printf ("%d", i & 1) ;

prints

(1) 0101010101   (2) 0111111111

(3) 0000000000   (4) 1111111111

72. The declaration

enum cities(bethlehem, jericho, nazareth = 1, jersualem)

assigns the value 1 to

(1) Bethlehem   (2) Nazareth

(3) Bethehem and nazareth   (4) Iericho and nazareth

73. Content addressable memory is one in which

(1) Data is searched directly without giving address

(2) Address is given and contents are read

(3) Address is applied and contents and stored

(4) None of the above

74. Indicate which is not type of digital modulation.

(1) Phase modulation   (2) Pulse code modulation

(3) Delta modulation   (4) Phase shift modulation

75. The baud rate.

(1) It always equal to bit transfer rate

(2) Is equal to twice the bandwidth of an ideal channel

(3) Is not equal to signalling rate

(4) Is equal to one half the bandwidth of an ideal channel

76. The difference between a Television and monitor is

(1) Monitor can not display TV signals

(2) Monitor can not directly display a clear picture

(3) Monitor can not give a steady picture

(4) None of the above

77. A fast access small capacity semiconductor memory is

(1) PROM   (2) RAM

(3) Scratchpad   (4) ROM

78. To enter the zeros in a register is called

(1) Return   (2) Reset

(3) Fill zero   (4) None of the above

79. Isolation in ICs is required.

(1) To make is simpler to test circuits

(2) Make discontinuous current as continuous

(3) Reduce the output voltage

(4) Increase the load voltage.

80. Most of the gain and selectivity in a super heterodyne receiver is obtained in the

(1) RF amplifier   (2) Mixer

(3) IF amplifier   (4) Demodulator

81. Modern ac to dc converters employ GTOs instead of SCRs in order to have

(1) Low reactive volt ampere flow (2) Reliable commutation

(3) Low switching loss   (4) Smaller heat sink.

82. For a single - phase two pulse phase - controlled rectifier, with a free wheeling diode across RL load,

(1) The instantaneous output voltage u_0 is always positive

(2) u_0 may be positive or zero

(3) u_0 may be positive, zero or negative

(4) u_0 is always zero or negative

83. The effect of source inductance on the performance of single - phase and three - phase full converters is to

(1) Reduce the ripples in the load current

(2) Make discontinuous current as continuous

(3) Reduce the output voltage

(4) Increase the load voltage.

84. A four quadrant operation requires

(1) Two full converters in series

(2) Two full converters connected back to back

(3) Two full converters connected in parallel

(4) Two - semi converters connected to back

85. In circulating current type of dual converter, the nature of voltage across reactor is

(1) Alternating   (2) Pulsating

(3) Direct   (4) Triangular.

86. The output of a single - phase full - wave rectifier contains

(1) Dc plus even harmonics

(2) Dc plus odd and even harmonics

(3) Dc plus both odd and even harmonics

(4) Dc and no harmonics

87. A time - margin for series inverter ensures

(1) Low power loss   (2) Safety of the device

(3) Improved power factor   (4) Absence of harmonics

88. The output voltage wave form of a 3 - phase square - wave inverter contains

(1) Only even harmonics   (2) Both odd and even harmonics

(3) Only odd harmonics   (4) Only triplan harmonics

89. Integral cycle control

(1) Is very fast in action

(2) Does not introduce sub - harmonics in the supply lines which are different to filter

(3) Cannot be used on inductive loads

(4) Can be advised only for loads with high item constants and limited range control.

90. A cycloconverter is a frequency converter from

1. higher to lower frequency with one - stage conversion

2. higher to lower frequency with two - stage conversion

3. lower to higher frequency with one - stage conversion

4. ac at one frequency to dc and then dc to ac at a different frequency

From these, the correct statements are

(1) 2, 4   (2) 1 only   (3) 2, 3   (4) 1,3

91. The cycloconverters (CCs) require natural or forced commutation as under:

(1) Natural commutation in both step - up and step - down CCs

(2) Forced commutation in both step - up and step - down CCs

(3) Forced commutation in the step - up CCs

(4) Forced commutation in step - down CCs

92. Consider the following statements regarding cycloconverters

1. In 1 - phase to 1 - phase CC, firing angle may be varied

2. In 3 - phase to 1 - phase CC, firing angle may be kept constant

3. In 3 - phase to 1 - phase CC, firing angle may be kept constant

4. In 3 - phase to 1 - phase CC, firing angle must be varied

From these, the correct statements are

(1) 2,4 ,   (2) 1, 3,

(3) 2,3   (4) 2,3,4

93. Bulk power transmission over HVDC lines are preferred on account of

(1) Low cost of HVDC terminals   (2) No harmonic problems

(3) Minimum line power   (4) Simple protection

94. The most accurate and versatile method of achieving reactive power compensation is by using.

(1) Switched capacitors

(2) Fixed capacitor with controlled reactor

(3) Saturable reactor with capacitor bank

(4) Saturable reactor with controlled reactor

95. A memory system has a total of 8 memory chips, each with 12 address lines and 4 data lines. The total size of the memory system is

(1) 6 kbytes

(2) 32 kbytes

(3) 48 kbytes

(4) 64 kbytes

96. In the transistor circuit shown in the figure, collector-to-ground voltage is +20 V. Which of the following is the probable error ?
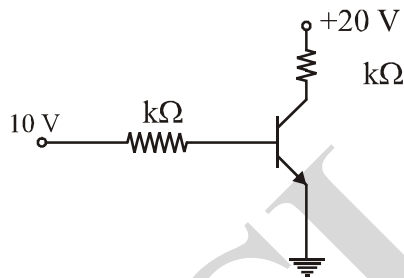
(1) 10

(2) 20

(3) 0

(4) 30

97. The network has 10 nodes and 17 branches. The number of different node pair voltages would be

(1) 7

(B)9

(3) 10

(4) 45

98. Two incandescent light bulbs of 40 W and 60W rating are connected in series across the mains. Then

(1) The bulbs together consume 100 W

(2) The bulbs together consume 50 W

(3) The 60 W bulb glows brighter

(4) The 40 bulb glows brighter

99. If 7 bits are used to store a character, the percentage reduction of need storage will be

(1) 22.5

(2) 2.5

(3) 8

(4) 12.5

100. Three different circuits for biasing junction transistor amplifiers are given below.
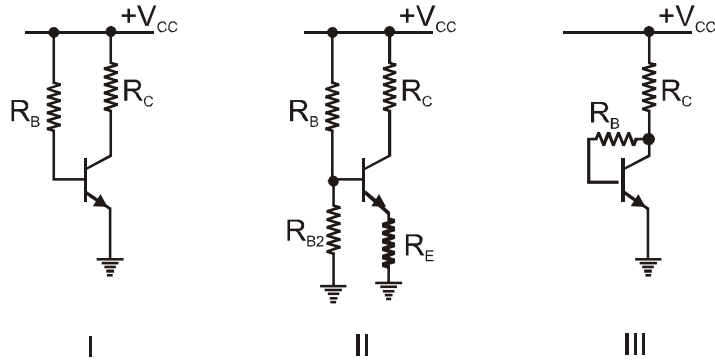
The currect decreasing order of preference of these circuits from the point of view of bias stabilisation is

(1) I, II, III   (2) III, II, I   (3) II, III, I   (4) I, III, II

ANSWER KEY
PAPER-II

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

HINTS AND SOLUTIONS
PAPER-II

1.(2) In counter, each filp flop will toggle when its clock receives a negative edge clock.

2.(2) The process of reducing quantity of data is Data reduction.

3.(1) The dynamic properties of sample and hold circuit are important in the overall performance of ADC.

4.(3) Interrupts Priority

TRAP 1st (highest)

RST T.S 2nd

RST 6.5 3rd

RST 5.5 4th

INTR 5th (Lowest).

5.(2) Band Typical services

VLF (3 – 30 KHz) word wide telegraphy

MF (300 – 3000 KNz) Broadcasting

SHF (3000 – 30, 000 MHz) Satellite communication

EHF (30, 000 – 300, 000 MHz) Government

6.(3) (1) Tunnel diode oscillator $\rightarrow$ A negative resistance oscillator for mw frequency

(2) UJT oscillator $\rightarrow$ Uses negative oscillator $\rightarrow$ resistance property for the gen eration of sowtooth waveform.

(3) Hartley oscillator $\rightarrow$ An LC oscillator used for generation of sinewave at RF.

(4) Blocking $\rightarrow$ Produces high current pulses of short.

7.(3) In a JFET.

(1) Pinch - off voltage decreases if channel doping reduced.

(2) Transconductance increases if channel length reduced.

(3) Transit time of carriers in channel is reduced if gate area reduced.

8.(2) (1) Multiplexer $\rightarrow$ Routes out many data output with single input

(2) De-Multiplexer $\rightarrow$ Data selector

(3) Shift register $\rightarrow$ Sequential memory

(4) Encoder $\rightarrow$ Converts decimal number to binary.

9.(3) AM – DSBFC $\rightarrow$ 1

WBFM $\rightarrow$ 3mf

PCM $\rightarrow$ 22N

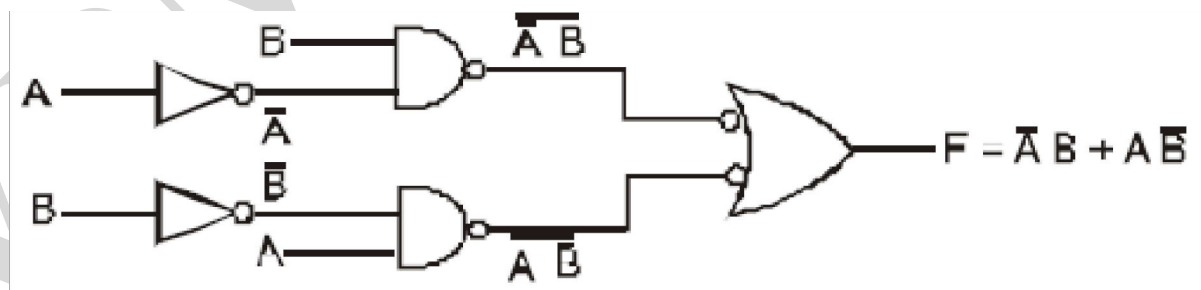AM – DSB $\rightarrow$ 2.

10.(3)　　Cass grain antenna $\rightarrow$ Radar.

Yagi antenna $\rightarrow$ Large Bandwidth

Parabolic reflector antenna $\rightarrow$ Directional transmission

Loop antenna $\rightarrow$ Direction Finding

11.(2)

$$F = \bar{A}\,B + A\,\bar{B}$$

12.(2) Serial adder requires only one full adder circuit and a carry flip - flop to store the output carry. While parallel adder is equal to the number of bits in the binary num- bers.

13.(3) 1110, 1100, 1111, 1010_2 = (ECFA)$_{16}$

(ECFA)$_{16}$ = $(14 * 16^3) + (12 * 10^2) + (15 * 16^1) + (10 * 16^0)$

= 57344 + 3072 + 240 + 10

= 60666_{10}

14.(4)

F (A, B, C) = (A + B + c) (A+B+C) . (A + B+C) PDS form of function.

15.(2) The code / fragment given is syntactically correct but will give a Run - time error as the data type is not matched with respect to the given format specifier. i.e. the given format specifier is for character data type not double.

16.(4) printf (*az") prints az and returns a value 2 (since it printed two characters). So, the condition results in the printing of az2. Since it always returns 2, it is an infinite loop. The output will be az2byaz2by. . .

17.(4) The else clause has no brackets i.e., {and}. This means the else clause is made up of only one statement. So, printf ("a < b"); will be executed anyway, i.e. if a > b or a < = b. Hence the answer is (4)

18.(1) The condition is putchar (0). This returns a value - which is a false condition. So , the loop will not be executed even once.

19.(4) If it is coming with in a function, the storage class will be taken to be automatic, otherwise external.

20.(2) In the parameters which are passed by value, the function will be manipulating a local copy of the argument value. Any change will be local to the function and hence will not be reflect in the calling environment. Thus the output will be 2,4

21.(1) In call by reference, the address of the actual arguments will be passed to the function. Any change done environment.

22.(2) In this case, the following statements will be executed by the function temp; M; M : = X[M]; X [X]: =temp; So. what is evaluated is temp : = 2; M : = X[2]; X[M]: = temp ; i.e., M will be assigned 4, after which X [M], i.e., X[4] will be assigned 2. X[2] remains unaltered. So 4, 4 will be printed.

23.(4) The correct statement are

1 Step-wise refinement uses top-down methodology

2 The use of library routines faciliate bottom=up methodology

24.(2) ECL is well suited for high-speed operation.

25.(2) The given arrangement of JK flip-flops does the functions of a Mod-3 counter.

26. (2) The return value of the function will be used by the compiler to invoke the correct function.

27.(4) All statements are correct.

28.(3) Function chg prints 112.

29.(1) If an induction type energy meter runs fast, it can be slowed down by adjusting the lag.

30.(2) The conversion time for a successive approximation increase with the increase in input voltage statement is not the correct.

31.(1) For a periodic function the spectral density and the autocorrelation functions form Fourier transforms pair.

32.(3) A. Collector modulation - AM generation

B. Phase shift method - SSB generation

C. Balanced modulator - DSB generation

D. Amplitude limiter - FM generation

33.(4) With a real-time constraint, the transmission bandwidth needed for a digital signal with r symbols per second is equal to or greater than 2r.

34.(2) A dc cumulatively compounded motor delivers rated load torque at rated speed, If the series field is short-circuited, then the armature current and speed will increases.

35.(3) The output voltage swing of a difference amplifier can be increased by using a correct mirror circuit is TRUE but the given Reason (R) is False.

36.(1) The part of the root locus on the real axis is not dependent upon the poles and zeros which are not on the real axis because poles and zeros which are not on the real axis always occur in conjugate pairs.

37.(1) For a minimum phase system, both phase margin and gain margin must be positive for the system to be stable. So the system is stable.

38.(2) Depth of penetration $= \delta = \sqrt{\dfrac{2}{\omega \mu \sigma}}$, where $\sigma = \dfrac{ne^2 \tau}{m}$ t = relaxation time

d would be small, if s is large, which itself depends upon relaxation time.
t for conductors is of the order of $10.^{14}$ s, for l = 3 × 10^{-2} cm

Period of centimetric EM waves $= \dfrac{\lambda}{V_0} = \dfrac{3 \times 10^{-2}}{3 \times 10^8} = 10^{-10}$ sec

Therefore, even though t is much smaller than period of centimetric waves but it is not the correct reason for the assertion given.

39.(4) Network card cannot be considered as an element of Multimedia computer

40.(2) Compiler check the syntactic correctness of a source program.

41.(2) Thermal noise power of a resistor depends upon noise temperature.

42.(1) A laser beam is
i. highly monochromatic
ii. used in communication wave
iii. An electro magnetic wave.

43.(1) Figure of merit is always unity in SSB-SC.

44.(3) The choice of the product RC in an envelope detector using a diode and an R-C circuit is governed by the depth of modulation and the lowest modulation frequency.

45.(3) The operation of an inverter fed induction motor can be shifted from motoring to regenerate braking by decreasing inverter frequency.

46.(2) In a hollow rectangular waveguide, phase velocity decreases with increase in frequency.

47.(2) In the equivalent circuit of a transmission line, if we replace the equivalent T network by p network them line equations remain unchanged.

48.(4) The Q-factor of a microwave resonant cavity is

i. Proportional to volume of the cavity

ii. Proportional to frequency of the wave

iii. Inversely proportional to metallic resistance of guide walls.

49.(1) The built in potential in semiconductor is Dependent to doping.

50.(3) An avalanche photo diode works on High Reverse Bias.

51.(4) TTL circuits with active pull up are preferred because of their stability for reasonable dissipation and speed of operation.

52.(1) Radiation efficiency of an antenna is defined as the ratio of total power radiated by an antenna to the net power accepted by the antenna from the connected transmitter.

53.(2) Compared to transistor and FETS the speed of switching in a schottky diode is lower.

54.(3) Introducing a resistor in the emitter of a common emitter amplifier stabilizes the d.c. operating point against variations in both temperature and b.

55.(3) In the design of digital logic families there is a trade off between fan out and power dissipation.

56.(3) The use of non-uniform quantization leads to increase in SNR for low level signals.

57.(3) A TTL <u>totem - pole circuit is</u> designed so that the output transistors provide voltage regulation.

58.(2) On a Ring counter , initially the first flip - flop is preset to 1. so the initial state is 1000.

59.(4) Correct order of precedence from higher to lowest is :-

++

*

+)

<

&&

60.(1) Yes it is true that DOS allows division of disk space into different portions called partitions

61.(4) ATTRIB is an external DOS Command.

62.(1) The most commonly used standard data code to represent alphabetical, numerical and punctuation characters used in electronic data processing system is called ASCII

63.(1) For x = 9 , y = 5 , z = 3 , the given statement if (x > y) && (y > z) will be true

64.(3) Infiniteness is not the characteristics of algorithm.

65.(4) The symbol used to add description comment to the flow chart is ANNOTATION symbol.

66.(1) Yes it is true that a derived data type is a combination of other already known types.

67.(2) Character is a basic data type.

68.(4) The left shift operator <<, pushes out the most significant (left-most) bit. If it happens to be a 1, a << 1, will not be same as multiplying a by 2.

69.(1) If the most significant bit is to be zero, the maximum number that can be stored in 7 bits is 127.

70.(4) The sum (or bit-wise OR) of a number and its 1's complement will be all 1's. How many 1's depends on how many bits are needed to represent the number. If the sum is 220 – 1, then the size of (int) in bits must be 20.

71.(1) The binary representation of odd numbers will have a 1 as the least significant digit. So, an odd number ANDed with 1, produces a 1, Even number end with 0. So, an even number ANDed with 1,produces a 0. This for loop generates even and odd numbers alternatively. So, it prints alternate 0's and 1's.

72.(4) The listed places will be assigned the values 0, 1, 1, 2 respectively.

73.(1) Content addressable memory is one in which data is searched directly without giving address

74.(2) Pulse code modulation is not the type of digital modulation.

75.(1) The baud rate is always equal to bit transfer rate.

76.(1) Monitor can not display TV signals

77.(1) PROM

78.(2) Reset

79.(4) To minimize electrical interaction between circuit components, isolation in ICs is required.

80.(3) Most of the gain and selectivity in a super heterodyne receiver is obtained in the IF amplifier.

81.(2) Modern ac to dc converters employ GT Os instead of SCRs in order to have reliable commutation.

82.(2) For a single - phase two pulse phase - controlled rectifier, with a freewheeling diode across RL load,u_0 may be positive or zero.

83.(3) The effect of source inductance on the performance of single - phase and three - phase full converters is to reduce the output voltage.

84.(3) A four quadrant operation requires two full converters connected in parallel.

85.(1) In circulating current type of dual converter, the nature of voltage across reactor is alternating.

86.(1) The output of a single - phase full - wave rectifier contains Dc plus even harmonics

87.(2) A time - margin for series inverter ensures safety of the device.

88.(3) The output voltage wave form of a 3 - phase square - wave inverter contains only odd harmonics.

89.(4) integral cycles control can be advised only for loads with high item constants and limited range control.

90.(4) A cycloconverter is a frequency converter from-

    (i). higher to lower frequency with one - stage conversion

    (ii). lower to higher frequency with one - stage conversion

91.(3) The cycloconverters (CCs) require natural or forced commutation as under forced commutation in the step - up CCs.

92.(2) Regarding cycloconverters -

    (i). In 1 - phase to 1 - phase CC, firing angle may be varied

    (ii). In 3 - phase to 1 - phase CC, firing angle may be kept constant

93.(3) Bulk power transmissions over HVDC lines are preferred on account of minimum line power.

94.(2) The most accurate and versatile method of achieving reactive power compenstion is by using fixed capacitor with controlled reactor.

95.(2) Each clip has 2^{12} = 4096k bytes = 4 k bytes then the memory has 8 × 4 bytes.

96.(2) For collector ground which is the same as emitter terminal to read full supply voltage at 20 V, no current should be drawn and this can happen if emitter to ground connection is open as then there will be neither I_H or I_C.

97.(2) The network has 10 nodes and 17 branches. The number of different node pair voltages would be 9.

98.(4) Two incandescent light bulbs of 40 W and 60W rating are connected in series across the mains. Then the 40 bulb glows brighter

99.(4) For each 8 bits one can save 1 bit. So percentage reduction will be 1/8*100 i.e., 12.5%.

100.(3) The currect decreasing order is II, III, I.

II circuit is the most stable , III circuit is less stable and I circuit is least stable.