

HAL Management Trainee Electronics

2. A series RLC circuit resonates at 3 MHz and has 3-dB bandwidth of 10 kHz. The Q of the circuit at resonance

- a) 30
- b) $\frac{300}{\sqrt{2}}$
- c) 300
- d) $300\sqrt{2}$

Ans.

4. At 3-dB frequencies, current in the series RLC circuit equal current at resonance multiplied by

- a) $\frac{1}{2}$
- b) $\frac{1}{\sqrt{2}}$
- c) $\frac{1}{4}$
- d) $\frac{1}{2\sqrt{2}}$

Ans.

www.PreviousExamPapers.com

5. A series RLC circuit resonates at 1000 kHz. At frequency of 995 kHz, the circuit impedance is

- a) Resistive
- b) minimum
- c) Inductive
- d) capacitive

Ans.

6. If each stage had gain of 10dB and noise figure of 10dB, then the overall noise figure of two-stage cascade amplifier will be

- a) 10
 - b) 1.09
 - c) 1.0
 - d) 10.9
-

Ans.

7. In Sigma delta ADC, high bit accuracy is achieved by

- a) Over sampling and noise shaping
- b) Over sampling
- c) Under sampling
- d) None of the above

Ans.

13. The transfer function, $T(s) = \frac{s}{s+a}$ is that of a

- a) Low-pass filter
- b) Notch filter
- c) High-pass filter
- d) Band-pass filter

Ans.

14. A particular current is made up of two components: a 10 A dc and a sinusoidal current of peak value of 1.414 A. The average value of the resultant current is

- a) Zero
- b) 24.14 A
- c) 10 A
- d) 14.14 A

Ans.

15. By doubling the sampling frequency www.PreviousExamPapers.com

- a) Quantisation noise decreases by 3dB
- b) Quantisation noise density decreases by 3dB
- c) Quantisation noise increases by 3dB
- d) Quantisation noise density increases by 3dB

Ans.

17. Assuming that only the X and Y logic inputs are available and their complements X and Y are not available, what is the minimum number of two-input NAND gates required to implement $X \oplus Y$?

- a) 2 b) 3 c) 4 d) 5

Ans.

19. A Pulse train with a frequency of 1MHz is counted using a modulo 1024 ripple-counter built with J-K flip-flops. For proper operation of the counter the maximum permissible propagation delay per flip-flop stage is

- a) 100 n sec b) 50 n sec c) 20 n sec d) 10 n sec

Ans.

20 The A/D converter used in a digital voltmeter could be (1) successive approximation type (2) Flash converter type (3) Dual slope converter type. The correct sequence in the increasing order of their conversion times is

- a) 1,2,3 b) 2,1,3 c) 3,2,1 d) 3,1,2

Ans.

21. The resolution of a D/A Converter is approximately 0.4% of its full-scale range it is

- a) An 8-bit converter b) A 10-bit converter
c) A 12 bit converter d) A 16 bit converter

Ans.

22. In a microprocessor, the register which holds the address of the next Instruction to be fetched is

- a) Accumulator b) Program Counter
c) Stack pointer d) instruction register

Ans.

23. In microcomputer, WAIT states are used to

- a) Make the processor wait during a DMA operation
- b) Make the processor wait during a power interrupt processing
- c) Make the processor wait during a power Shutdown
- d) Interface slow peripherals to the processor

Ans.

24. Which of the following statements are correct

- 1. A flip-flop is used to store 1 bit of information
- 2. Race-around Condition occurs in a J-K flip-flop when both the inputs are 1
- 3. Master- slave configuration is used in flip-flops to store 2 bits of information
- 4. A transparent latch consists of a D-type flip-flop

- a) 1,2 and 3 b) 1,3 and 4 C) 1,2 and 4 d) 2,3 and 4

Ans.

25 How many 1's are present in the binary representation of $3 \times 512 + 7 \times 64 + 5 \times 8 + 3$?

- a) 8 b) 9 c) 10 d) 11

Ans.

26. For emitter-coupled logic, the Switching speed is very high because

- a) Negative logic, is used
- b) The transistors are not saturated when Conducting
- c) Emitter-coupled transistors are used
- d) Multi- emitter transistors are used

Ans.

28. Gray code for number 7 is

- a) 1100 b) 1001 C) 0110 d) 0100

Ans.

29. 10 bit A/D converters, the quantization error is given by (in Percent)

- a) 1 b) 2 c) 0.1 d) 0.2

Ans.

32. If the memory chip size is 256×1 bits, then the number of chips required to make up 1K bytes of memory is

- a) 32 b) 24 c) 12 d) 8

Ans.

33. Given the decimal number — 19, an eight bit two's complement representation is given by

- a) 11101110 b) 11101101 c) 11101100 d) None of these

Ans.

36. A 4-bit synchronous Counter Uses flip-flops with propagation delay time of 25 ns each. The maximum possible time required for change of state will be

- a) 25 ns b) 50 ns C) 75 ns d) 100 ns

Ans.

37. An electromagnetic Wave incident on a perfect Conductor is:

- a) Entirely reflected b) Fully transmitted
c) Partially transmitted d) None of these

Ans.

38. The characteristic impedance of a lossless transmission line is given by

- a) $Z = \sqrt{LC}$ b) $Z = \sqrt{C/L}$ c) $Z = LC$ d) $Z = \sqrt{L/C}$

Ans.

**39. A lossless line of 50 ohms is terminated in a load of 100 ohms resistive
The VSWR is**

- a) 1:2 b) 2:1 c) 4:1 d) 1:4

Ans.

40. Which of the following does not exist in waveguides

- a) TE waves b) TM waves
c) TE waves and TM waves d) TEM waves

Ans.

41. carriers of 2GHz and 4GHz respectively are frequency modulated by a signal of 10 KHz, such that bandwidth of the FM signal in the two cases are same. The peak deviation in the two cases are in the ratio of

- a) 1:8 b) 1:2 c) 2:1 d) 1:1

Ans.

42. The bandwidth required for QPSK modulated channel is

- a) Twice the BW of BPSK
- b) Equal to BPSK
- C) Equal to FSK
- d) Half of the BW of BPSK

Ans.

43. Magic T is

- a) Four part junction
- b) Two part junction
- C) Three part junction
- d) It is not junction

Ans.

44. Diplexer is made of

- a) Only receive filter
- b) Only transmit filter
- c) Only circulator
- d) Both receive filter and transmit filter

Ans.

45. The gain G of an antenna of effective area A is given by

- a) $G = \frac{4\pi\lambda}{A^2}$
- b) $G = \frac{4\pi A}{\lambda}$
- C) $G = \frac{4\pi A}{\lambda^2}$
- d) None

Ans.

46. If the short circuit and open circuit impedance of a line are 5 and 20Ω respectively the characteristic impedance is given by

- a) 100Ω
- b) 10Ω
- c) 15Ω
- d) 10000Ω

Ans.

47. The input impedance of short circuited line of length l where $\lambda/4 < l < \lambda/2$, is

- a) Capacitive b) Inductive c) Resistive d) None of these

Ans.

48. Maximum coding gain in

- a) Block Codes b) Convolution Codes
c) Turbo Codes d) RS Codes

Ans.

49. Noise figure of an amplifier depends on

- a) Bandwidth b) Output power c) Power input d) none of the above

Ans.

50. BCH code belongs to

www.PreviousExamPapers.com

- a) Block Codes b) Convolution Codes
c) Turbo Codes d) None of the above

Ans.

51. When a carrier is phase modulated, with an integrated modulating signal, the resultant is

- a) Phase modulated signal b) Frequency modulated signal
c) Amplitude modulated signal d) QPSK modulated signal

Ans.

52. A satellite orbiting in 600 km orbit transmits 5 GHz frequency. The Doppler shift observed at the ground station, when the satellite is over head of the station is

- a) Zero b) Maximum c) Infinity d) None of the above

Ans.

53. A communication channel disturbed by additive white Gaussian noise has a bandwidth of 4 kHz and SNR of 15. The highest transmission rate that such a channel can support (in k-bits/sec) is

- a) 16 b) 1.6 c) 3.2 d) 60

Ans.

54. A dual directional Coupler is connected in a microwave reflectometer measurement setup. The reading of the Power meter in the forward direction is 100 mw and in the reverse direction 4 mw. The VSWR is

- a) 4 h) 0.4 c) 1.5 d) 10

www.PreviousExamPapers.com

Ans.

55. Linear amplifier with a gain of 30dB is fed with 1.0 μ W power, the output Power of the amplifier

- a) 1.0 W b) 0 dBm C) 30 dBm d) -30 dBm

Ans.

56. 10 Watt RF Power is transmitted with a circular polarized antenna

having gain of 10dB. A receiving antenna has vertical polarization. The path loss is 100dB. The receiving signal is

- a) -83dBW h) -80dBW C) -86dBW d) +80dBW

Ans.

58. A rigid body is rotating with constant angular velocity ω about a fixed axis, if v is the velocity of a point of the body, then $\text{curl } v =$

- a) ω b) ω^2
c) 2ω d) $2\omega^2$

Ans.

59. Laplace transform of $\sin^3 2t$ is

- a) $\frac{24}{(s^2+4)(s^2+36)}$ b) $\frac{1}{(s^2+4)(s^2+64)}$
c) $\frac{48}{(s^2+4)(s^2+36)}$ d) $\frac{64}{(s^2+4)(s^2+36)}$

Ans.

www.Previous
$$\begin{vmatrix} \cos \theta & 0 & \sin \theta \\ 0 & 1 & 0 \\ -\sin \theta & 0 & \cos \theta \end{vmatrix}$$
 is

60. The value of the determinant

- a) 0 b) -1 c) 1 d) 2

Ans.

62. The value of k for which the lines $2x + y - 1 = 0$, $4x + 3y - 3 = 0$ and $3x + ky - 2 = 0$, are Concurrent is

- a) -2 b) 3 c) 2 d) -3

Ans.

63. A box contains 5 black and 5 red balls. Two balls are randomly picked one after another from the box, without replacement. The probability for both balls being red is

- a) $1/90$ b) $1/5$ c) $19/90$ d) $2/9$

Ans.

64. $X^3 + x \sin x$ is

- a) Constant function b) Odd function
c) Even function d) Periodic function

Ans.

66. Eigen values of $\begin{bmatrix} -5 & 2 \\ 2 & -2 \end{bmatrix}$ are

- a) -6, -1 b) 6, -1 c) -6, 1 d) 6, 1

Ans.

68. An inductor supplied with 50 V ac with a frequency of 10 kHz passes a current of 7.96 mA. The value of inductor is

www.PreviousExamPapers.com

- a) 1mH b) 10mH c) 100mH d) 1H

Ans.

69. In a capacitor, the electric charge is stored in

- a) Dielectric b) Metal plates
c) Dielectric as well as metal plates d) Neither dielectric nor metal plates

Ans.

70. Oscillator requires

- a) No feedback b) Negative feedback
c) Positive feedback d) Either positive or negative feedback

Ans.

71. Which loss in a transformer varies significantly with load?

- a) Hysteresis loss b) Eddy current loss
c) Copper loss d) Core loss

Ans.

72. The resistance of a parallel circuit consisting of two resistors is 12Ω . One of the resistance wires breaks and the effective resistance becomes 18Ω . The resistance of the broken Wire is

- a) 48 b) 18 c) 36 d) 24

Ans.

73. Time constant of a series R-L circuit equals

- a) L/R second www.PreviousExamPapers.com
b) LR second c) L^2R d) LR^2

Ans.

79. When L is doubled and C is halved, the resonance frequency of series tuned circuit becomes

- a) Doubled b) Halved c) One quarter d) Unchanged

Ans.

80. In a Series resonant circuit, with the increase in L

- a) Resonant frequency will decrease
- b) Bandwidth will decrease
- c) Q will increase
- d) All of these

Ans.





www.PreviousExamPapers.com