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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (S, FE) / S6 (PT) (S) Examination January 2024 (2019 Scheme)

Course Code: ECT 308

Course name: COMPREHENSIVE COURSE WORK

Max. Marks: 50 Duration: 1Hour

Instructions: ***(1) Each question carries one mark. No negative marks for wrong answers***
(2) Total number of questions: 50
(3) All questions are to be answered. Each question will be followed by 4 possible answers of which only ONE is correct.
(4) If more than one option is chosen, it will not be considered for valuation.

1. The early effect in BJT is caused by .

   a) Fast turn OFF b) Fast turn ON c) Large emitter to base forward bias d) Large collector to base reverse bias

2. The Efficiency of half wave bridge rectifier under best condition is:

   a) 25.5% b) 35% c) 40.6% d) 81.2%

3. Which of the following BJT configuration has highest power gain

   a) Common Collector b) Common Emitter c) Common Base d) None of the above

4. What is the purpose of a coupling capacitor in an amplifier circuit?

   a) To filter out high-frequency noise b) To block DC and allow AC signals to pass c) To provide power supply to the amplifier d) To increase the gain of the amplifier

5. What is the purpose of negative feedback in an amplifier?

   a) Increase distortion b) Increase gain c) Improve stability and reduce distortion d) Decrease bandwidth

6. In a transistor if $\beta = 100$ and collector current is 10 m A ,then I_E is .....

   a) 100 mA b) 10.10 mA c) 110 mA d) None of the above

7. In the hybrid-π model for the BJT small signal analysis, r_π denotes

   a) Input resistance b) Trans conductance c) Output resistance d) Trans impedence

8. Oscillators requires.....

   a) No feedback b) Negative feedback c) Positive feedback d) None of the above

9. The unit of voltage gain.....

a) dB b) Volt c) Ampere d) No unit

10. How many cascaded stages of CE amplifier will results in polarity inversion of the input signal
a) Two b) Three c) Four d) None of these

11 If $(432)_5 = (X)_7$,then the value of X is
a) 522 b) 225 c) 252 d) 250

12 A (7,4) hamming code contains ..... parity bits.
a) 4 b) 2 c) 3 d) 1

13 The decimal equivalent of binary 10110.11 is :
a) 16.75 b) 20.75 c) 16.50 d) 22.75

14 If A and B are the Boolean variables, then what is $(A+B).(A+\bar{B})$ equal to ?
a) B b) A c) A+B d) AB

15 The dual of A+B+C is .....
a) A.B.C b) A+BC c) (A+B).C d) (A.B+C)

16 Which gates corresponds to the action of parallel switches ?
a) AND b) OR c) NAND d) NOR

17 An OR gate has 4 input in which one input is high and other three are low. The output
a) Is low b) Is high c) Alternately high and low d) None of these

18 A sequential circuits with twelve states will have:
a) 10 flipflop b) 12 flipflop c) 4 flipflop d) 3 flipflop

19 Which of the following is not a sequential circuit?
a) flipflop b) counter c) register d) decoder

20 The noise margin of a TTL gate is about
a) 0.2 V b) 0.4 V c) 0.8 V d) 0.6 V

21 What is CMRR ,if A_d = 30 dB and A_c = 2 dB ?
a) 26 dB b) 28 dB c) 32 dB d) 15 dB

22 Logarithmic amplifiers are used in .....
a) Adders b) Dividers c) Multipliers d) All of the above

23 What is PSRR value of an Ideal Op-amp
a) Zero b) unity c) infinite d) unpredictable

24 The rise time of low pass RC circuit is given by
a) 2.2RC b) 30.2RC c) 10RC d) 22RC

25 The following configuration is an example of positive feedback system:
a) Inverting amplifier b) Non-Inverting amplifier c) Schmitt Trigger d) None of these

26 What is the Time period of a Monostable 555 Multivibrator ?

a) T=3 RC b) T=3.3 RC c) T=1.1RC d) T=1.3RC

27 What is the primary purpose of a phase-locked loop (PLL) in linear integrated circuits?

a) Voltage amplification b) Frequency synthesis and synchronization c) Voltage stabilization d) None of these

28 Which configuration of an operational amplifier provides a voltage gain greater than 1 ?

a) Inverting amplifier b) Non Inverting amplifier c) Differential amplifier d) Voltage follower

29 What is the primary function of a voltage-controlled oscillator (VCO) in linear integrated circuits?

a) Voltage amplification b) Frequency modulation c) Voltage stabilization d) Digital signal processing

30 Find the gain of a Non inverting amplifier, if Vi=1V ,Rf=10K, Ri=1K

a) 10 b) 1000 c) 11 d) Infinity

31 DFT performs filtering operation in

a) Time domain b) Frequency domain c) Both time and frequency domain d) None of these

32 DFT of impulse signal is

a) 2π b) π c) 1 d) 0

33 Let x[n] ={0, 1, A, 2, 3, 4}. If X[0]=10 , A= ?

a) A=0 b) A=1 c) A=10 d) A=3

34 In impulse invariant transformation, relationship between Ω and ω is

a) $\Omega = \omega T$ b) $\Omega = \omega/T$ c) $\omega = \Omega/T$ d) None of these

35 The frequency response of a digital filter is

a) periodic b) Non periodic c) May be periodic or non-periodic d) None of these

36 Down sampling by a factor of D skips

a) D samples b) (D-1) samples c) No samples d) (D+1) samples

37 The finite word length effects are due to

a) Quantization of input b) Quantization of product c) Quantization of coefficient d) All of the mentioned

38 The steady state noise power due to input quantization is $\sigma_e^2 =$

a) $\frac{2^{-2b}}{12}$ b) $\frac{2^{-2b}}{6}$ c) 2^{-2b} d) 2^{-b}

39 For rectangular window the main lobe width is equal to

a) $2\pi/N$ b) $4\pi/N$ c) $8\pi/N$ d) $12\pi/N$

40 The number of complex multiplication involved in the direct computation of 8-point DFT is

a) 8 b) 64 c) 16 d) 56

41 Quantizing noise occurs in .....

a) TDM b) FDM c) PCM d) PWM

42 Companding is used to .....

a) Overcome aliasing b) Overcome degradation of SNR c) Overcome quantization error d) Increase data rate

43 In a communication system , the signal power is 13dB and noise power is -1 dB. The SNR will be.

a) 14 dB b) -13dB c) 12 dB d) None of these

44 The spectral density of white noise is.....

a) Exponential b) uniform c) Poisson d) Gaussian

45 Noise figure for an ideal receiver is .....

a) 0 b) 0.1 c) 1 d) 10

46 Boosting of higher frequency at the transmitter is done by using

a) De-emphasis b) AGC circuit c) Pre-emphasis d) Armstrong method

47 Which of the following pulse modulation is analog?

a) PCM b) Differential PCM c) PWM d) Delta Modulation

48 The main advantage of super heterodyne is .....

a) Simple circuit b) Better tracking c) Improvement in selectivity and sensitivity d) Better alignment

49 The channel capacity is measured in terms of :

a) Bit per channel b) Number of input channels connected c) Call per channel d) bits

50 In a PCM system each quantization level is encoded into 7 bits. The signal-to-quantization noise ratio is equal to

a) 25.8dB b) 34.6dB c) 43.9dB d) 49.8dB