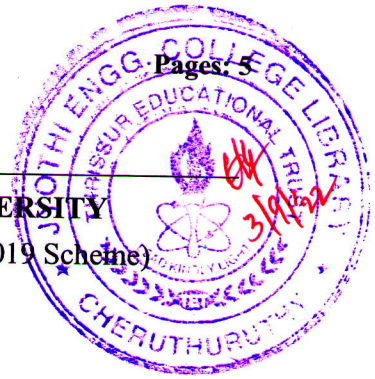


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Sixth Semester B.Tech Degree Examination June 2022 (2019 Scheme)

**Course Code: ECT308****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 wave shaping elements are _____.
 - a) Resistor
 - b) Capacitor
 - c) Diode
 - d) All are correct
2. The formula used to calculate the time constant in inductive circuit is _____.
 - a) RC
 - b) L/R
 - c) R/C
 - d) LC/R
3. Transistor biasing represents Conditions
 - a) AC
 - b) DC
 - c) Both AC and DC
 - d) None of these
4. For faithful amplification by a transistor circuit, the value of V_{BE} should For a silicon transistor
 - a) Be zero
 - b) Be 0.01 V
 - c) Not fall below 0.7 V
 - d) Be between 0 V and 0.1 V
5. If the collector supply is 10V, then collector cut off voltage under d.c. conditions is
 - a) 20V
 - b) 5 V
 - c) 2 V
 - d) 10 V
6. The input capacitor in an amplifier is the capacitor
 - a) Coupling
 - b) Bypass
 - c) Leakage
 - d) None of the above
7. If a transistor amplifier draws 2mA when input voltage is 10 V, then its input impedance is
 - a) 20 K Ω
 - b) 2 K Ω
 - c) 10 K Ω
 - d) 5 K Ω
8. A CE amplifier is also called circuit
 - a) Grounded Emitter
 - b) Grounded Base
 - c) Grounded Collector
 - d) None of these
9. If a three stage amplifier has individual stage gains of 10db, 6db and 15db; then the total gain in db is _____.
 - a) 600 dB
 - b) 24 dB
 - c) 14 dB
 - d) 31 dB

10. Ideal regulated power supply is one which has voltage regulation of
- a) 0% b) 1% c) 10% d) 5%
11. The representation of octal number $(532.2)_8$ in decimal is _____
- a) $(346.25)_{10}$ b) $(532.864)_{10}$ c) $(340.67)_{10}$ d) $(531.668)_{10}$
12. Convert binary to octal: $(110110001010)_2 = \dots$
- a) $(5512)_8$ b) $(6612)_8$ c) $(4532)_8$ d) $(6745)_8$
13. The expression for Absorption law is given by _____
- a) $A + AB = A$ b) $A + AB = B$ c) $AB + AA' = A$ d) $A + B = B + A$
14. De Morgan's theorem states that _____
- a) $(AB)' = A' + B'$ b) $(A + B)' = A' * B$ c) $A' + B' = A'B'$ d) $(AB)' = A' + B$
15. The logical sum of two or more logical product terms is called _____
- a) SOP b) POS c) OR operation d) NAND operation
16. There are _____ Minterms for 3 variables (a, b, c).
- a) 0 b) 2 c) 8 d) 1
17. Perform binary addition: $101101 + 011011 = \dots$
- a) 011010 b) 1010100 c) 101110 d) 1001000
18. All logic operations can be obtained by means of _____
- a) AND and NAND operations b) OR and NOR operations c) OR and NOT operations d) NAND and NOR operations
19. If A and B are the inputs of a half adder, the sum is given by _____
- a) A AND B b) A OR B c) A XOR B d) A XNOR B
20. A latch is an example of a _____
- a) Monostable multivibrator b) Astable multivibrator c) Bistable multivibrator d) 555 timer
21. Which of the following electrical characteristics is not exhibited by an ideal op-amp?
- a) Infinite voltage gain b) Infinite bandwidth c) Infinite output resistance d) Infinite slew rate
22. If output is measured between two collectors of transistors, then the Differential amplifier with two input signal is said to be configured as _____
- a) Dual Input Balanced Output b) Dual Input Unbalanced Output c) Single Input Balanced Output d) Dual Input Unbalanced Output
23. An inverting amplifier with gain 1 have different input voltage: 1.2 V, 3.2 V and 4.2 V. Find the output voltage?
- a) 4.2 V b) 8.6 V c) -4.2 V d) -8.6 V

- 24 If the gain of a non-inverting averaging amplifier is one, determine the input voltages, if the output voltage is 3 V?
 a) $V_1 = 6$ V, $V_2 = 3$ V and $V_3 = 2$ V b) $V_1 = 9$ V, $V_2 = 5$ V and $V_3 = -4$ V c) $V_1 = 8$ V, $V_2 = -6$ V and $V_3 = 1$ V d) $V_1 = 7$ V, $V_2 = 4$ V and $V_3 = -3$ V
- 25 The temperature of a thermistor increases, when the value of its resistance....
 a) Remains constant b) Increase c) Decrease d) Depends on the heating element
- 26 What is Barkhausen criterion for oscillation?
 a) $A\beta > 1$ b) $A\beta < 1$ c) $A\beta = 1$ d) $A\beta \neq 1$
- 27 What will be the phase shift of feedback circuit in RC phase shift oscillator?
 a) 360° phase shift b) 180° phase shift c) 90° phase shift d) 60° phase shift
- 28 The condition for zero phase shift in Wein bridge oscillator is achieved by...
 a) Connecting feedback to non-inverting input terminal of op-amp b) Balancing the bridge c) Applying parallel combination of RC to the feedback network d) All of the mentioned
- 29 How do we determine the time period of a monostable 555 multivibrator.
 a) $T = 0.33RC$ b) $T = 1.1RC$ c) $T = 3RC$ d) $T = RC$
- 30 At which state the phase-locked loop tracks any change in input frequency?
 a) Free running state b) Capture state c) Phase locked state d) All of the mentioned
- 31 Which of the following is true regarding the number of computations requires to compute an N-point DFT?
 a) N^2 complex multiplications and $N(N-1)$ complex additions b) N^2 complex additions and $N(N-1)$ complex multiplications c) N^2 complex multiplications and $N(N+1)$ complex additions d) N^2 complex additions and $N(N+1)$ complex multiplications
- 32 If $W_4^{100} = W_x^{200}$, then what is the value of x?
 a) 2 b) 4 c) 8 d) 16
- 33 Which of the following is true in case of Overlap add method?
 a) M zeros are appended at last of each data block b) M zeros are appended at first of each data block c) M-1 zeros are appended at last of each data block d) M-1 zeros are appended at first of each data block
- 34 What is the highest frequency that is contained in the sampled signal?
 a) $2F_s$ b) $F_s/2$ c) F_s d) None of the mentioned

- 35 If $\{x(n)\}$ is the signal to be analyzed, limiting the duration of the sequence to L samples, in the interval $0 \leq n \leq L-1$, is equivalent to multiplying $\{x(n)\}$ by?
 a) Kaiser window b) Hamming window c) Hanning window d) Rectangular window
- 36 Computational complexity refers to the number of _____
 a) Additions b) Arithmetic operations c) Multiplications d) None of the mentioned
- 37 Which of the following is a method for implementing an FIR system?
 a) Direct form b) Cascade form c) Lattice structure d) All of the mentioned
- 38 What is the process of reducing the sampling rate by a factor D ?
 a) Sampling rate conversion b) Interpolation c) Decimation d) None of the above
- 39 In recursive systems, which of the following is caused because of the nonlinearities due to the finite-precision arithmetic operations?
 a) Periodic oscillations in the input b) Non-Periodic oscillations in the input c) Non-Periodic oscillations in the output d) Periodic oscillations in the output
- 40 What is the expansion of DPCM?
 a) Differential Pulse Code Modulation b) Different Pulse Code Modulation c) Differential Plus Code Modulation d) None of the mentioned
- 41 The value of a resistor creating thermal noise is doubled. The noise power generator is therefore....
 a) Halved b) Quadrupled c) Doubled d) Unchanged
- 42 Which of the following is the most reliable measurement for comparing amplifier noise characteristics?
 a) Signal-to-Noise ratio b) Noise factor c) Shot noise d) Thermal noise agitation
- 43 If E denotes the expectation, the variance of a random variable X is denoted as?
 a) $(E(X))^2$ b) $E(X^2) - (E(X))^2$ c) $E(X^2)$ d) $2E(X)$
- 44 Which of the following mentioned standard Probability density functions is applicable to discrete Random Variables?
 a) Gaussian Distribution b) Poisson Distribution c) Rayleigh Distribution d) Exponential Distribution
- 45 Non uniform quantizer _____ distortion.
 a) Increases b) Decreases c) Does not affect d) None of the mentioned
- 46 The spectral density of white noise is....
 a) Exponential b) Uniform c) Poisson d) Gaussian
- 47 The term heterodyning refers to.....
 a) Frequency conversion b) Frequency mixing c) Frequency conversion and mixing d) None of the mentioned

- 48 Roll off factor is the fraction of...
- a) Excess bandwidth and absolute bandwidth b) Excess bandwidth and minimum Nyquist bandwidth c) Absolute bandwidth and minimum Nyquist bandwidth d) None of the mentioned
- 49 The detector that minimizes the error probability is called as.....
- a) Maximum likelihood detector b) Minimum likelihood detector c) Maximum & Minimum likelihood detector d) None of the mentioned
- 50 Wavelength and antenna size are related as...
- a) $\lambda/2$ b) $\lambda/4$ c) 2λ d) 4λ
