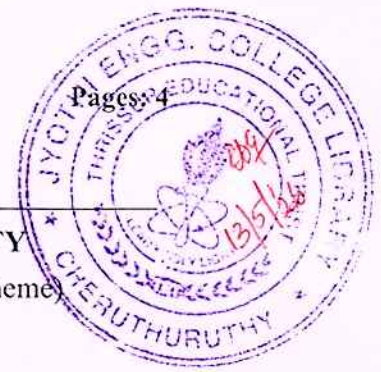




Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (R,S) (FT/PT) Examinations April 2026 (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 input capacitor in an amplifier is the capacitor
a) Coupling b) Bypass c) Leakage d) None of the above
2. If a three stage amplifier has individual stage gains of 10db, 6db and 15db; then the total gain in db is
a) 600dB b) 24dB c) 14dB d) 31dB
3. The voltage gain of amplifier stage is lowest in
a) Common Emitter b) Common Base c) Common Collector d) Same in all configuration
4. 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
5. Which of the following power amplifiers has highest efficiency
a) Class A b) Class B c) Class AB d) Class C
6. A full wave rectifier circuit using centre tapped transformer, input frequency is 50Hz. The frequency of the output is
a) 100Hz b) 50Hz c) 25Hz d) 200Hz
7. In an oscillator the total phase shift around the loop must be
a) 180° b) 90° c) 270° d) 0°
8. For a BJT, α and β are related as
a) $\alpha = \frac{\beta}{1 - \beta}$ b) $\beta = \frac{1}{1 + \alpha}$ c) $\beta = \frac{\alpha}{1 - \alpha}$ d) $\beta = \frac{\alpha}{1 + \alpha}$
9. If the gain of positive feedback amplifier is 18 and feedback factor is 0.5, the gain of the amplifier without feedback will be

- a) 18 b) 1.8 c) 180 d) 3.6
10. A Hartley oscillator is used for generating..... frequency oscillation
a) Very low b) Radio c) Microwave d) Audio
11. Convert octal number 643_8 to binary.
a) 101100110 b) 110100011 c) 1001100111 d) 011100110
12. The logical product of two or more logical sum terms is called
a) SOP b) POS c) OR operation d) NAND operation
13. The dual of $A+B+C$ is
a) ABC b) $A+BC$ c) $(A+B)C$ d) $AB+C$
14. How many flip-flops are required to build a sequential circuit which has 20 states?
a) 4 b) 5 c) 6 d) 3
15. The minimum number of gates required to realize the function $AB + \bar{C}$ using NAND only is
a) 2 b) 3 c) 4 d) 5
16. In Boolean algebra $\bar{A}+A$ is equal to
a) 1 b) 0 c) A d) $\bar{A}$
17. A mod 6 counter will count
a) From 0 to 6 b) From 0 to 5 c) From any number n to n+6 d) None of the above
18. The flip-flops which has not any invalid states are
a) S-R, J-K, D b) S-R, J-K, T c) J-K, D, S-R d) J-K, D, T
19. The largest three digit hexadecimal number is
a) FEE b) FFF c) *EEF d) EFE
20. Which of the following technology results in least power dissipation
a) TTL b) DTL c) NMOS d) CMOS
21. How do we determine the time period of a monostable 555 multivibrator
a) $T=0.33RC$ b) $T=1.1RC$ c) $T=3RC$ d) $T=RC$
22. For an inverting amplifier $R_i = 10k\Omega$ and feedback resistor is $R_f = 100k\Omega$. Then closed loop gain of OP-amp is
a) -10 b) -11 c) -1 d) Infinity
23. What is Barkhausen criterion for oscillation?
a) $A\beta < 1$ b) $A\beta > 1$ c) $A\beta = 1$ d) $A\beta = 0$
24. Given that CMRR is 100dB. Input common-mode voltage is 12 V. Differential voltage gain is 4000. Calculate output common-mode voltage.
a) 48V b) 0.48V c) 20 d) 11
25. The output of an op-amp is out of phase with the input connected to the inverting (-) terminal.

- a) 0^0 b) 90^0 c) 180^0 d) 270^0
- 26 What is PSRR value of an Ideal Op-amp?
a) Zero b) Unity c) Infinite d) Negative
- 27 The functional diagram of a 555 Timer IC consists of Comparators.
a) 3 b) 2 c) 1 d) No comparators
- 28 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
- 29 What is the maximum frequency for a sine wave output voltage of 10V peak with an op-amp, whose slew rate is $1\text{V}/\mu\text{s}$
a) 15.92KHz b) 19.92KHz c) 25.92KHz d) 27.36KHz
- 30 The number of comparator in a 4-bit Flash ADC is
a) 4 b) 5 c) 15 d) 16
- 31 Given $x[n] = \{1, 2, 0, 3, -2, 4, 7, 5\}$, calculate $X[4]$.
a) 20 b) -8 c) -20 d) 4
- 32 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
- 33 If a signal is sampled at a rate less than the Nyquist rate, the resulting effect is called
a) Quantization b) Distortion c) Aliasing d) Attenuation
- 34 The computation of 32-point DFT by Radix-2 DIT-FFT involvesstages of computation.
a) 6 b) 5 c) 3 d) 2^5
- 35 In FIR filter,is a linear function of ω .
a) Amplitude b) Phase c) Frequency d) None of the above
- 36 Peak side lobe in dB of a rectangular widow is
a) -13dB b) -32dB c) -26dB d) -3dB
- 37 Find the circular convolution between two sequences $x(n) = \{2, 1, 2, 1\}$ and $y(n) = \{1, 2, 3, 4\}$.
a) $\{2, 5, 10, 16\}$ b) $\{14, 14, 16, 16\}$ c) $\{14, 16, 14, 16\}$ d) $\{2, 5, 10, 16, 11, 2\}$
- 38 The process of reducing the sampling rate by a factor D is called ----
a) Decimation b) Interpolation c) Sampling rate conversion d) None of these
- 39 Find $x(n) * \delta(n-n_0)$.

- a) $x(n+n_0)$ b) $x(n-n_0)$ c) $x(-n-n_0)$ d) $x(-n+n_0)$
- 40 The frequency response of a digital filter is periodic in the range
- a) $0 < \omega < 2\pi$ b) $-\pi < \omega < +\pi$ c) $0 < \omega < \pi$ d) None of these
- 41 Which of the following probability density functions is applicable to discrete Random Variables?
- a) Gaussian Distribution b) Poisson Distribution c) Rayleigh Distribution d) Exponential Distribution
- 42 For efficient radiation, the length of the antenna should be at least
- a) A significant fraction of λ b) Much smaller than λ c) Equal to λ d) Twice λ
- 43 A super heterodyne radio receiver with an intermediate frequency of 455 KHz, the local oscillator tuned to 1200 KHz. The associated image frequency is -----KHz.
- a) 765 b) 1655 c) 2100 d) 900
- 44 In a communication system, the signal power is 13dB and noise power is -1 dB. The SNR will be
- a) 14dB b) -13dB c) 12dB d) None of these
- 45 Noise figure for an ideal receiver is
- a) 0 b) 0.1 c) 1 d) 10
- 46 In delta modulation, the slope overload distortion can be reduced by
- a) Decreasing the step size b) Decreasing the granular noise c) Decreasing the sampling noise d) Increasing the step size
- 47 A broadcast amplitude modulation radio transmitter radiates 140 kW when the modulation percentage is 75. Find the carrier power?
- a) 120.45kW b) 142.26kW c) 109.26kW d) 172.82kW
- 48 In FM modulation, when the modulation index increases, the transmitted power?
- a) Half b) Decreased c) Doubled d) Unchanged
- 49 Eye diagram gives an idea of
- a) Modulation scheme b) CLOCK jitter c) SNR d) All the mentioned
- 50 If the number of bits per sample in a PCM system is increased from a n to n + 1, the improvement in signal to quantization noise ratio will be
- a) 2n dB b) 3dB c) 6dB d) 2(n+1) dB
