Department of Electronics

M.Phil. Admission Test

Time : 90 minutes

NOTE: There are total of **30 MCQs**. There is **no Negative** marking.

*Required

1. Write your *

- Name:
- Father's Name:
- CNIC:

2. We ..... tomorrow morning. The train ..... at 7:45 a.m..
(1 point)

◯ will leave/leaves
◯ leave/is leaving
◯ are leaving/leaves
◯ leave/leaves

3. They have put speed bumps on the road to ..... accidents.
(1 point)

◯ prohibit
◯ prevent
◯ avoid
◯ forbid

4. You should drive ..... if you don't want to have an accident.
(1 point)
◯ slower
◯ more slowly
◯ more slower
◯ carelessly

5. A diode is helpful in the designing of
(1 point)
◯ Amplifier
◯ Rectifier
◯ Integrator
◯ Differentiator

6. For a common emitter bipolar junction transistor, which of the following terminal is grounded
(1 point)
◯ Base
◯ Collector
◯ Emitter
◯ None of the above

7. The output of operational amplifier changes from 0V to 0.25V in 0.1 micro second. The slew rate of this amplifier is
(1 point)
◯ 2.5 $\frac{V}{\mu s}$
◯ -2.5 $\frac{V}{\mu s}$
◯ 0.25 $\frac{V}{\mu s}$
◯ 1 $\frac{V}{\mu s}$

8. The beta of a transistor is the ratio of the
(1 point)
◯ Collector current to emitter current
◯ Collector current to base current
◯ Base current to collector current
◯ Emitter current to collector current

9. Open loop input impedance of an ideal operational amplifier is
(1 point)
◯ Infinity
◯ 1KΩ
◯ 100Ω
◯ ZeroΩ

10. For a non-inverting amplifier configuration based upon the operational amplifier, what is the ratio of feedback to input resistance ratio for a voltage gain of 10.
(1 point)
◯ 5
◯ 9
◯ 10
◯ 2.5

11. In computer, logical and arithmatic operations are performed using the
(1 point)
◯ Arithmetic unit
◯ Logical unit
◯ Arithmetic logical unit
◯ RAM

12. Which of the following is the universal gate
(1 point)
◯ Xor
◯ And
◯ Or
◯ Nor

13. The type of a variable determines:
(1 point)
◯ How much space it occupies in storage
◯ How the bit pattern stored is interpreted
◯ Both of the above
◯ None of the above

14. Volatile memory in computer is
(1 point)
◯ ROM
◯ RAM
◯ USB
◯ Hard Drive

15. The following program
#include <stdio.h>
int main()
{ int x; print("%p",&x); return 0; }
prints:
(1 point)
◯ Value of x
◯ Address of x
◯ &
◯ None of the above

16. In amplitude modulation (AM), the bandwidth of the resultant signal is
(1 point)
◯ Bandwidth of the base band signal
◯ Twice the bandwidth of the base band signal
◯ Half the bandwidth of the base band signal
◯ Not related with the bandwidth of the base band signal

17. In angle modulation, frequency of the carrier signal $\cos(wt)$ changes with
(1 point)
◯ Frequency of the message signal $m(t)$
◯ Power of the message signal $m(t)$
◯ Energy of the message signal $m(t)$
◯ Amplitude of the message signal $m(t)$

18. The minimum sampling interval of $g(t) = 3\sin(2\pi 100t)$ is
(1 point)
◯ 0.002 Sec.
◯ 0.005 Sec.
◯ 0.001 Sec.
◯ None of the above

19. A control system with the transfer function $H(s) = (s-1)/(s-2)$ is
(1 point)
◯ Unstable
◯ Stable
◯ Oscillating
◯ Can not be determined

20. Equating the denominator of the transfer function to zero gives
(1 point)
◯ Poles
◯ Zeros
◯ Both poles and zeros
◯ None of the above

21. The derivative of $f(x)$ = -6cos(x) at $x = 0$ is
(1 point)
◯ -6
◯ 2.72
◯ 0
◯ 3.0

22. How many roots of the function $f(x) = \cos(x)$ lies within the interval [1,10]
(1 point)
◯ 0
◯ 1
◯ 2
◯ 3

23. For a signal $x(t)$, the quantity $|x(t)|^2$ represents
(1 point)
◯ Total energy of the signal
◯ Average power of the signal
◯ Instantaneous power of the signal
◯ Amplitude of the signal

24. A Linear Time-Invariant (LTI) system with impulse response $h(t)$ is causal if and only if
(1 point)
◯ $\int_{-\infty}^{\infty} |h(t)|^2 dt < \infty$.
◯ $h(t) = 0$, for $t < 0$
◯ $h(t) = 0$, for $t \neq 0$
◯ $h(t) = 0$, for $T \leq t \leq 0$

25. The value of the complex number $\sqrt{-1}$ is
(1 point)
◯ $\pm i$
◯ $\pm$ 1
◯ 1
◯ -1

26. The value of $e^{-i\pi}$ is
(1 point)
◯ 1
◯ -1
◯ 3
◯ $-\pi$

27. The power series of $1/(z-1)$ is
(1 point)
◯ 1 + iz - $z^2/(2!)$ + ...
◯ 1 - $z^2/(2!)$ + $z^4/(4!)$ + ...
◯ -1-z-z^2 - .....
◯ z - $z^3/(3!)$ + $z^5/(5!)$ + ...

28. The general solution of the differential equation

$$\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 4y = 0$$

(1 point)
◯ $y = A\sin(2x) + B\cos(2x)$
◯ $y = A\sin(x) + B\cos(x)$
◯ $y = A\sinh(2x) + B\cosh(2x)$
◯ $y = Ae^{-2x} + Be^{-2x}$

29. The value of $\oint_c f(z)/(z-4)dz$ is
(1 point)
◯ $\pi i \frac{d^2}{dz^2} f(4)$
◯ $\pi i \frac{d^2}{dz^2} f(z)$
◯ $2\pi i \frac{d}{dz} f(4)$
◯ $2\pi i f(4)$

30. Permeability defines the
(1 point)
◯ Electrical response of a material
◯ Magnetic response of a material
◯ Effect of external force
◯ None of the above

31. Electrostatic means
(1 point)
◯ Study of moving charges
◯ Study of static charges
◯ Study of heat
◯ Study of sound