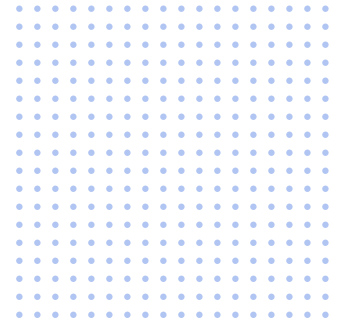




FOR KUET EXAM PREPARATION

KUET 2023 Question Paper · M.Sc. Electronics

EXAM	YEAR	TYPE	SUBJECT
KUET	2023	Question Paper	M.Sc. Electronics

Sr. No.

ENTRANCE TEST-2023**SCHOOL OF APPLIED SCIENCES AND TECHNOLOGY****ELECTRONICS**

Total Questions : 60
Time Allowed : 70 Minutes

Question Booklet Series**A****Roll No. :**

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Instructions for Candidates :

1. Write your Entrance Test Roll Number in the space provided at the top of this page of Question Booklet and fill up the necessary information in the spaces provided on the OMR Answer Sheet.
2. OMR Answer Sheet has an Original Copy and a Candidate's Copy glued beneath it at the top. While making entries in the Original Copy, candidate should ensure that the two copies are aligned properly so that the entries made in the Original Copy against each item are exactly copied in the Candidate's Copy.
3. All entries in the OMR Answer Sheet, including answers to questions, are to be recorded in the Original Copy only.
4. Choose the correct / most appropriate response for each question among the options A, B, C and D and darken the circle of the appropriate response completely. The incomplete darkened circle is not correctly read by the OMR Scanner and no complaint to this effect shall be entertained.
5. Use only blue/black ball point pen to darken the circle of correct/most appropriate response. In no case gel/ink pen or pencil should be used.
6. Do not darken more than one circle of options for any question. A question with more than one darkened response shall be considered wrong.
7. There will be '**Negative Marking**' for wrong answers. Each wrong answer will lead to the deduction of 0.25 marks from the total score of the candidate.
8. Only those candidates who would obtain positive score in Entrance Test Examination shall be eligible for admission.
9. Do not make any stray mark on the OMR sheet.
10. Calculators and mobiles shall not be permitted inside the examination hall.
11. Rough work, if any, should be done on the blank sheets provided with the question booklet.
12. OMR Answer Sheet must be handled carefully and it should not be folded or mutilated in which case it will not be evaluated.
13. Ensure that your OMR Answer Sheet has been signed by the Invigilator and the candidate himself/herself.
14. At the end of the examination, hand over the OMR Answer Sheet to the invigilator who will first tear off the original OMR sheet in presence of the Candidate and hand over the Candidate's Copy to the candidate.

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1. A coil of inductance $L=5.00\mu\text{H}$ and a capacitor of $C=200\text{ pF}$ is connected in series. Suppose the frequency is $f=4.00\text{ MHz}$. What is the net reactance?
 - (A) $-j\ 73$
 - (B) $j\ 73$
 - (C) $-j\ 199$
 - (D) $-j\ 126$
2. The complex admittance of a certain parallel circuit is $0.010 - j0.0050$. What is the complex impedance of this same circuit, assuming the frequency does not change?
 - (A) $80 + j\ 20$
 - (B) $80 + j\ 40$
 - (C) $40 + j\ 40$
 - (D) $80 - j\ 40$
3. Which of the following is not a characteristic of an independent voltage source?
 - (A) voltage independent of magnitude of current drawn
 - (B) voltage dependent on magnitude of current drawn
 - (C) independent of direction of current flow
 - (D) can supply or receive uninterrupted energy at constant voltage
4. A practical voltage source can be represented by
 - (A) an ideal voltage source with its internal resistance connected in series
 - (B) an ideal voltage source with its internal resistance connected across its terminals
 - (C) by neglecting the internal resistance
 - (D) none of these
5. When $R = 0$ in a series RLC circuit, but the net reactance is not zero, the impedance vector
 - (A) always points straight up.
 - (B) always points straight down.
 - (C) always points straight toward the right.
 - (D) None of the above is correct.
6. A Zener diode would most likely be found in
 - (A) the mixer in a super heterodyne receiver.
 - (B) the PLL in a circuit for detecting FM.
 - (C) the product detector in a receiver for SSB.
 - (D) the voltage regulator in a power supply.
7. A diode can be used as a frequency multiplier because of its
 - (A) junction capacitance.
 - (B) nonlinearity.
 - (C) avalanche voltage.
 - (D) forward break over.
8. Correct answer from these points:
 - a. tunnel diode used for high frequency switching operations.
 - b. tunnel diode uses a high doping level to provide a narrow junction.
 - (A) True, False
 - (B) False, False
 - (C) True, True
 - (D) False, True
9. The following is a negative differential resistance diode:
 - (A) PN Junction diode
 - (B) Zener diode
 - (C) Tunnel diode
 - (D) Schottky diode

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10. Which of the following substances is sometimes used as the semiconductor material in junction field-effect transistors (JFETs) ?
 (A) Gallium arsenide
 (B) Mica
 (C) Glass
 (D) Polystyrene
11. A common-collector transistor circuit is often used :
 (A) to provide high gain and sensitivity over a wide range of frequencies.
 (B) to match a high impedance to a low impedance.
 (C) as a high-fidelity audio power amplifier.
 (D) as an oscillator at microwave frequencies.
12. Suppose a bipolar-transistor amplifier has a dc collector input of 115 W and an ac power output of 65.0 W. What is the efficiency in percent ?
 (A) 50 %
 (B) 5.6 %
 (C) 5 %
 (D) 56.5 %
13. A twin T oscillator is commonly used for generating
 (A) AF signals.
 (B) High-frequency RF signals.
 (C) Microwave RF signals.
 (D) Powerful bursts of RF energy.
14. A circuit has a rms ac input voltage of 24.2 V and a rms ac output voltage of 19.9 V. What is the gain in decibels?
 (A) 1.7 dB
 (B) -1.7dB
 (C) 0.0849 dB
 (D) 20 dB
15. The frequency at which a quartz crystal oscillator produces energy is largely dependent on :
 (A) the load impedance.
 (B) the physical thickness of the quartz wafer.
 (C) the amount of resistance through the crystal.
 (D) the power-supply voltage.
16. An FET amplifier is 60 percent efficient. If the power output is 3.5 W, what is the dc drain power input ?
 (A) 5.8 W
 (B) 4.0 W
 (C) 8.8 W
 (D) 7.0 W
17. What is the binary equivalent of decimal 29 ?
 (A) 10101
 (B) 11101
 (C) 10111
 (D) 11011
18. The time period of a monostable 555 multivibrator :
 (A) RC
 (B) 3RC
 (C) 1.1RC
 (D) 0.33 RC
19. An audio amplifier is an example of
 (A) Digital IC
 (B) Linear IC
 (C) Both digital and linear IC
 (D) None of the above
20. In voltage follower circuit the input and output voltages are :
 (A) $V_{in} = 2V$ and $V_{out} = 3V$
 (B) $V_{in} = 10V$ and $V_{out} = 11V$
 (C) $V_{in} = 9V$ and $V_{out} = 9V$
 (D) $V_{in} = 4V$ and $V_{out} = 7V$
21. CMRR value of an ideal instrumentation amplifier :
 (A) 1
 (B) 0
 (C) Infinity
 (D) 0.5

22. Inverters are placed in series with both inputs of an AND gate. Under what conditions is the output of the resulting black box high ?
- If and only if both inverter inputs are high
 - If and only if both inverter inputs are low
 - If and only if one inverter input is high and the other is low
 - Under no conditions (the output is always low)
23. What is the octal equivalent of binary 1010 ?
- 4
 - 10
 - 12
 - There is no way to tell without more information.
24. What is the largest possible radix 10 number that can be represented as a six-digit binary number ?
- Decimal 256
 - Decimal 128
 - Decimal 64
 - Decimal 63
25. Frequency deviation in FM is :
- Change in carrier frequency to the frequency above and below the centre frequency
 - Formation of side bands
 - The variation of the instantaneous carrier frequency in proportion to the modulating signal
 - All of the above
26. DeMorgan's Theorem states that, for all logical statements X and Y, where _____ is complement.
- $\neg (X * Y) = X + Y$
 - $X * Y = \neg (X + Y)$
 - $(\neg X) + (\neg Y) = X * Y$
 - $(\neg X) + (\neg Y) = \neg (X * Y)$
27. If you see a number represented by FF in the documentation for an electronic circuit or system, you can be certain that the number is
- radix 16.
 - radix 10.
 - radix 8.
 - radix 2.
28. A binary digital black box with two inputs, called X and Y and an output Z. If $X = 0$ and $Y = 1$, then $Z = 0$. In all other instances, $Z = 1$. Which of the following logical expressions represents the contents of the black box ?
- $X + (\neg Y)$
 - $X * (\neg Y)$
 - $X - (*Y)$
 - $X = (\neg Y)$
29. Suppose a logic circuit has four inputs W, X, Y, and Z. How many possible input combinations are there ?
- 4
 - 8
 - 16
 - 32
30. What can be done to minimize the capacitance of the P-N junction in a semiconductor diode, thereby making the component effective as a high-speed RF switch ?
- The surface area of the P-N junction can be maximized.
 - A layer of intrinsic semiconductor can be placed between the P- and N-type materials.
 - The frequency of the applied signal can be made as high as possible.
 - The diode can be forward-biased with a high voltage.

31. Notch filter is a :
 (A) Band pass filter
 (B) Band stop filter
 (C) Low pass filter
 (D) High pass filter
32. What is the wavelength if the frequency is 4MHz ?
 (A) 75 meters
 (B) 75 km
 (C) 75 cm
 (D) 75 mm
33. Signal attenuation, or degradation, exists in all media of wireless transmission. It is proportional to the :
 (A) the distance between the transmitter and receiver
 (B) difference of the distance between the transmitter and receiver
 (C) square of the distance between the transmitter and receiver
 (D) summation of the distance between the transmitter and receiver
34. TCP stands for :
 (A) Transmission Control Protocol
 (B) Transmission Capture Protocol
 (C) Transmission Control Procedure
 (D) Transistor Capacitor Power
35. A receiver that responds to a desired signal, but not to another signal very close by in frequency, has good
 (A) Sensitivity.
 (B) Noise figure.
 (C) Dynamic range.
 (D) Selectivity.
36. The domain name system (DNS) is chiefly used to translate hostnames into :
 (A) Alphabetical address
 (B) Numeric IP addresses
 (C) Analog address
 (D) All of the above
37. A continuously variable signal can be recovered from a signal having only a few discrete levels or states by means of :
 (A) a ratio detector.
 (B) a D/A converter.
 (C) a product detector.
 (D) an envelope detector.
38. An AM super heterodyne receiver with IF of 455 kHz is tuned to the carrier frequency of 1000 kHz. The image frequency is :
 (A) 545 kHz
 (B) 1 MHz
 (C) 1455 kHz
 (D) 1910 kHz
39. In FM signal with a modulation index m_f is passed through a frequency Tripler. The wave in the output of the Tripler will have a modulation index of :
 (A) m_f
 (B) $3m_f$
 (C) $m_f/3$
 (D) $m_f/9$
40. The maximum power efficiency of an AM modulator is :
 (A) 25%
 (B) 33%
 (C) 50%
 (D) 100%
41. Which of the following modes is used to send image data over telephone lines ?
 (A) On/offkeying
 (B) Fax
 (C) AM
 (D) Product detection

42. READY signal used in an intel 8085 microprocessor is :
- To indicate to user that the microprocessor is working and is ready for use.
 - To provide proper WAIT states when the microprocessor is communicating with a slow peripheral device.
 - To slow down a fast peripheral device so as to communicate at the microprocessor's device.
 - None of the above.
43. The 8085 has six general-purpose registers to store 8-bit data; these are identified as :
- A, C, D, E, H, and L
 - B, C, D, E, H, and I
 - B, C, D, E, H, and L
 - B, C, D, E, F, and L
44. The ALU includes five flip-flops, which are set or reset after an operation according to data conditions of the result in the accumulator and other registers. These flags are :
- Z, CY, S, P and AC
 - A, CY, S, P and AC
 - F, CY, S, P and C
 - W, CY, S, P and A
45. Immediate addressing in 8085 example is :
- MVI data, R
 - MVI R, data
 - MOV R, data
 - MOVE R, data
46. Trap interrupt is a non-maskable restart interrupt; it has the priority of any interrupt.
- Lowest
 - Medium
 - Less
 - Highest
47. Which one is not correct in 8085 microprocessors ?
- RAC Rotate the accumulator to Carry. Bit 0 goes to bit 7 AND the Carry flag
 - RAR Rotate the accumulator right through the carry. Bit 0 goes to the Carry and carry goes to bit 7.
 - RLC Rotate the accumulator left. Bit 7 goes to bit 0 and the carry flag.
 - RAL Rotate the accumulator left through the carry. Bit 7 goes to the carry and carry goes to bit 0.
48. The 8085 has 16 address lines. So, it can address a total of memory locations :
- 65K
 - 64K
 - 128K
 - 16K
49. The 8051 is an :
- 8-bit microcontroller with 8-bit data bus and 16-bit address bus.
 - 16-bit microcontroller with 16-bit data bus and 16-bit address bus.
 - 16-bit microcontroller with 8-bit data bus and 8-bit address bus.
 - 8-bit microcontroller with 8-bit data bus and 8-bit address bus.
50. The 8051 has :
- 3 internal interrupts, 3 external interrupts.
 - 4 internal interrupts, 2 external interrupts.
 - 2 internal interrupts, 2 external interrupts.
 - 3 internal interrupts, 2 external interrupts.

51. The interrupt has highest priority in 8051 microcontrollers :
 (A) IE0
 (B) TF0
 (C) IE1
 (D) TF1
52. In addressing of 8051 The storage of addresses that can be directly accessed is :
 (A) external data RAM
 (B) internal data ROM
 (C) internal data RAM and SFRS
 (D) external data ROM and SFRS
53. For measuring a very high resistance we should use :
 (A) Kelvin's double bridge
 (B) Wheatstone bridge
 (C) Meggar
 (D) None of the above
54. An ammeter shunt is useful because :
 (A) It increases meter sensitivity.
 (B) It makes a meter more physically rugged.
 (C) It allows for measurement of a wide range of currents.
 (D) It prevents overheating of the meter.
55. The main advantage of a FETVM over a conventional voltmeter is the fact that the FETVM :
 (A) Can measure lower voltages.
 (B) Draws less current from the circuit under test.
 (C) Can withstand higher voltages safely.
 (D) Is sensitive to AC as well as to DC.
56. Integrating instruments among the following is :
 (A) Ammeters
 (B) Voltmeters
 (C) Wattmeter
 (D) Watt-hour meters
57. In an enhancement-mode MOSFET,
 (A) the channel conducts fully with zero gate bias.
 (B) the channel conducts partially with zero gate bias.
 (C) the channel conducts ac but not dc.
 (D) the channel does not conduct with zero gate bias.
58. The high input impedance of a MOSFET makes this type of device ideal for use in
 (A) weak-signal amplifiers.
 (B) high-power oscillators.
 (C) high-current rectifiers.
 (D) antenna tuning networks.
59. A significant difference between MOSFETs and JFETs is the fact that :
 (A) MOSFETs can handle a wider range of gate bias voltages.
 (B) MOSFETs can deliver greater output power.
 (C) MOSFETs are more rugged.
 (D) MOSFETs last longer.
60. An optocoupler consists of :
 (A) two Zener diodes back-to-back.
 (B) an LED and a photodiode.
 (C) two NPN transistors in series.
 (D) an NPN transistor followed by a PNP transistor.

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