Question Booklet Alpha Code



Total Number of Questions : 100

Time : 90 Minutes

Question Booklet SI. No

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Maximum Marks : 100

INSTRUCTIONS TO CANDIDATES

- 1. The Question Paper will be given in the form of a Question Booklet. There will be four versions of Question Booklets with Question Booklet Alpha Code viz. **A**, **B**, **C** & **D**.
- 2. The Question Booklet Alpha Code will be printed on the top left margin of the facing sheet of the Question Booklet.
- 3. The Question Booklet Alpha Code allotted to you will be noted in your seating position in the Examination Hall.
- 4. If you get a Question Booklet where the alpha code does not match to the allotted alpha code in the seating position, please draw the attention of the Invigilator IMMEDIATELY.
- 5. The Question Booklet Serial Number is printed on the top right margin of the facing sheet. If your Question Booklet is un-numbered, please get it replaced by new Question Booklet with same alpha code.
- 6. The Question Booklet will be sealed at the middle of the right margin. Candidate should not open the Question Booklet, until the indication is given to start answering.
- 7. Immediately after the commencement of the examination, the candidate should check that the Question Booklet supplied to him/her contains all the 100 questions in serial order. The Question Booklet does not have unprinted or torn or missing pages and if so he/she should bring it to the notice of the Invigilator and get it replaced by a complete booklet with same alpha code. This is most important.
- 8. A blank sheet of paper is attached to the Question Booklet. This may be used for rough work.
- 9. Please read carefully all the instructions on the reverse of the Answer Sheet before marking your answers.
- 10. Each question is provided with four choices (A), (B), (C) and (D) having one correct answer. Choose the correct answer and darken the bubble corresponding to the question number using Blue or Black Ball Point Pen in the OMR Answer Sheet.
- 11. Each correct answer carries 1 mark and for each wrong answer 1/3 mark will be deducted. No negative mark for unattended questions.
- 12. No candidate will be allowed to leave the examination hall till the end of the session and without handing over his/her Answer Sheet to the Invigilator. Candidates should ensure that the Invigilator has verified all the entries in the Register Number Coding Sheet and that the Invigilator has affixed his/her signature in the space provided.
- 13. Strict compliance of instructions is essential. Any malpractice or attempt to commit any kind of malpractice in the Examination will result in the disqualification of the candidate.

- 1. The mobility of electrons in a semiconductor is defined as the
 - A) Drift velocity per unit magnetic field
 - B) Diffusion velocity per unit magnetic field
 - C) Drift velocity per unit electric field
 - D) Diffusion velocity per unit electric field
- 2. In an intrinsic semiconductor, the free electron concentration depends on
 - A) The width of the forbidden energy band of the semiconductor
 - B) Effective mass of the electrons only
 - C) Effective mass of the holes only
 - D) Temperature of the semiconductor
- 3. Silicon is not suitable for fabrication of LEDs, because it is
 - A) A direct band gap semiconductor
 - B) An indirect band gap semiconductor
 - C) A narrow band gap semiconductor
 - D) A wide band gap semiconductor
- 4. Resistivity of a semiconductor depends on
 - A) Carrier mobility
 - B) Life time of polycrystalline materials
 - C) Carrier concentration in intrinsic semiconductor
 - D) Carrier concentration in extrinsic semiconductor
- 5. The diffusion length of a carrier depends on
 - A) The shape of the semiconductor
 - B) The life time of the carriers alone
 - C) The mobility and lifetime of the carriers
 - D) The mobility of the carriers alone
- 6. In an n-type semiconductor, as temperature increases, the Fermi level
 - A) Moves towards the conduction band
 - B) Moves towards middle of forbidden energy gap
 - C) Does not shift
 - D) May or may not shift depending on the concentration of donor atoms

- 7. Barrier potential in a PN junction is caused by
 - A) Thermally generated electrons and holes
 - B) Diffusion of majority carriers across the junction
 - C) Migration of minority carriers across the junction
 - D) Flow of drift current
- 8. The change in barrier potential of a silicon PN junction with temperature is
 - A) 0.0025 volts per degree C B) 0.0250 volts per degree C
 - C) 0.0030 volts per degree C D) 0.0014 volts per degree C
- 9. Consider a PN junction in which the P side is ten times more heavily dopped than N side. The depletion region would extend
 - A) Equally on both N and P sides
 - B) More towards the P side and less towards the N side
 - C) More towards the N side and less towards the P side
 - D) Cannot be predicted
- 10. Negative resistance characteristics is exhibited by a

	A) Zener diode	B) Schottky diode	C)	Photo diode	D)	Tunnel diode
11.	The zener breakdowr	n voltage	as	temperature is inc	rea	sed.
	A) Decreases		B)	Increases		
	C) Remains constant	t	D)	None of the abov	е	
12.	Varactor diodes are u	ised in				
	A) Tuning of an LC c	ircuit	B)	Special types of a	amp	lifiers
	C) Parametric amplif	iers	D)	All of the above		
13.	In a tunnel diode, imp	ourity concentration is	of t	he order of		
	A) 1 in 10 ³	B) 1 in 10 ⁵	C)	1 in 10 ⁷	D)	1 in 10 ⁹
14.	The ripple factor of po	ower supply is a meas	sure	of		
	A) Its filter efficiency		B)	Diode rating		
	C) Purity of power ou	itput	D)	Its voltage regula	tion	
15.	Transformer utilizatio	n factor of a full wave	rec	tifier is		
	A) 0.400		\mathbf{a}			0.004

A) 0.482 B) 0.693 C) 1.11 D) 0.821

16.	Peak inverse voltage A) Vm	of each diode in a br B) 2 Vm	idge rectifier is C) Vm/2	D) 3 Vm
17.	For the capacitor filte A) Max	r, under no load cond B) 0	lition, the ripple C) 1	is D) None
18.	In the diode volt amperent between the voltages A) 100 Ω	ere characteristics what 50 to 100 and corres B) 50 Ω	at will be the resis sponding curren C) 10 Ω	stance, if a slope is drawn t 5 to 10 ? D) 5 Ω
19.	In a zener regulator, A) Zener voltage C) Both A) and B)	the change in load cu	rrent produces, B) Zener curre D) None of the	change in ent e above
20.	For a filter, no load of The regulation of the A) 9.6%	utput voltage is 300 V circuit is B) 4.2%	' and full load ou C) 6.75%	utput voltage is 280 V. D) 7.1%
21.	A series LCR circuit is frequency is A) 153 kHz	s resonant at 150 kHz B) 148.5 kHz	and has a Q of C) 147.5 kHz	50. The lower half power D) 200 kHz
22.	A 220 V DC motor ha current of 20 A, then A) 210 V	as an armature resista the back emf induced B) 230 V	ance of 0.5 Ω a l is C) 250 V	nd the full load armature D) 110 V
23.	Transformers are rateA) Varying voltageC) Varying power	, ed in KVA, because th	ney are working B) Varying cu D) Varying po	with rrent wer factor
24.	In slip ring induction (A) Rotor rheostat C) Flux control	motor which type of s	peed control is u B) Stator rheo D) Armature c	used ? stat ontrol
25.	Superposition theore element. A) Non-linear C) Linear bilateral	m can be applicable c	only to circuits h B) Passive D) Resistive	aving

- 26. Determine the value of V_{EE} in UJT which causes the UJT to turn off, Re = 1 k ohm, Iv = 10 mA
 - A) 5 V B) 10 V
 - C) 12 V D) 7 V
- 27. Turn off of SCR is usually measured from the instant
 - A) Anode current become zero
 - B) Gate current become zero
 - C) Anode voltage become zero
 - D) Anode current and voltage become zero for same instant
- 28. Operating frequency of an IGBT is around
 - A) Greater than 50 kHz

- B) Less than 50 kHz
- C) Less than1 MHz D) Greater than 1 MHz
- 29. For a given input signal to the relay circuit what is the minimum value of output voltage



- 30. While doing base width modulation in BJT (NPN)
 - A) V_{CB} is variable
 - B) V_{BE} is variable
 - C) V_{CB} is reverse biased and variable
 - D) V_{CB} is forward biased and variable
- 31. For a given emitter current the collector current can be increased by
 - A) By reducing the recombination in base region
 - B) By reducing the base voltage in base emitter region
 - C) By increasing the base voltage in base emitter region
 - D) None of the above

- 32. Width of the conductions channel in MOSFET is
 - A) Large at source side and decreasing at drain end
 - B) Large at drain side and decreasing at source end
 - C) Almost same from source to drain
 - D) More current will form drain to source hence width at drain end is large and source end is less
- 33. Pinch off voltage of JFET is
 - A) The source to drain voltage at which the drain current start to saturate
 - B) The source to drain voltage at which the source current start to saturate
 - C) The drain to source voltage at which the drain current start to saturate
 - D) The drain to source voltage at which the source current start to increase
- 34. When latch up occurs in IGBT
 - A) I_C is no longer controllable
- B) Ig is no longer controllable
- C) I_E is no longer controllable D) Both I_E and Ig are not controllable
- 35. Secondary breakdown occur in BJT due to
 - A) Negative temperature coefficient of resistance
 - B) Positive tap coefficient of resistance
 - C) Heavily dropped emitter region
 - D) Heavily dropped collector region
- 36. Which one of the following device is not a switched mode DC power supply ?
 - A) Resistant converter B) Push pull converter
 - C) Full bridge converter D) Fly back forward converter

37. SMPSs are widely used than linear power supply due to

- A) Size and efficiency B) Efficiency and regulations
- C) Noise and cost D) Regulations and noise
- 38. An AC LVDT has _____ input and _____ output.
 - A) AC, DCB) AC, ACC) DC, DCD) DC, AC

Α

- 39. No contact is made between armature and core in
 - A) Capacitive armature LVDTC) Inductive armature LVDT
- 40. As per Stefan's law of radiation heat reduced by a body surfaces is
 - A) Directly proportional to square of absolute temperature
 - B) Directly proportional to the 4th power of its absolute temperature
 - C) Inversely proportional to the 4th power of its absolute temperature
 - D) Inversely proportional to the square of the absolute temperature

41. With Wheatstone bridge we can measure the resistance of _____ range.

- A) 100 Ω to a few teraohms
- C) 10 Ω to 1000 Ω
- 42. The types of faults in a telephone line are
 - A) symmetrical and unsymmetrical
 - C) line to line or line to ground D) open cire
- 43. Which of the following statement are incorrect ?
 - 1. The main part of CRO is CRT
 - 2. A CRO can be used for direct measurement of power
 - 3. Time base generator is a part of CRT
 - 4. A CRO is used to measure phase displacement
 - A) 1, 2 and 4 only B) 2 and 3 only
 - C) 3 and 4 only D) All of the above
- 44. A circle is seen on the screen of a CRO when two time varying signals of same frequency and same magnitude are applied to X and Y plates of CRO. The relative phase difference is :
 - A) 360°
 B) 90°

 C) 180°
 D) 45°
- 45. Which of the following modes of operation allows you to change the processor mode from a program/operator device and perform online program editing using programmable logic control ?
 - A) REM modeB) PROG modeC) Test modeD) Run mode

D) 1 Ω to a few teraohms

B) 1 Ω to a few megaohms

- B) triple line to line or line to ground
- D) open circuit and closed circuit

B) Spring extended armature LVDTD) Unguided armature LVDT

46. Which of the following statement is not correct with IC741 ?			
A) Infinite voltage gain	B) Zero input impedance		
C) Zero output impedance	D) Infinite bandwidth		
47. An operational amplifier is labelled as LM the given IC is	741. The manufacturer's designation of		
A) Motorola	B) Texas instruments		
C) National semiconductor	D) RCA		
48. If a capacitor is placed in the feedback pa act as	th of an op-amp circuit, then the circuit		
A) Differentiator	B) Schmitt Trigger		
C) Comparator	D) Integrator		
49. If $A_{DM} = 3500$ and $A_{CM} = 0.35$, the CMRF	R is		
A) 1000	B) 1001		
C) 10000	D) 101		
50. The common mode voltage gain of a differ	ential amplifier is equal to RC divided by		
A) r'e	B) 2r'e		
C) r'e'2	D) 2RE		
51. An operational amplifier with a gain of -10 the feedback resistance (R _f) is	and input resistance (R _j) equal to 10 k $\Omega,$		
Α) 100 kΩ	B) –10 kΩ		
C) -1 kΩ	D) 10 kΩ		
52. In which state the PLL tracks any change	in input frequency is at		
A) Capture Range	B) Pull-in-time		
C) Hysteresis	D) Locked Range		
53. Which of the following statement is correct	t for 555 IC timers ?		
i. It operates in single mode			
ii. It operates in two modes			
iii. It operates in three modes			
iv. It operates in four modes			
A) Only ii and iii	B) Only iii		
C) Only iv	D) Only i and iv		

54.	What instrument is used to amplify the outpA) Peak detectorC) Instrumentation amplifier	out signal of a transducer ? B) Differential amplifier D) Bridge amplifier			
55.	In a R-2R ladder DAC, the typical value of A) 3 k Ω to 10 k Ω C) 2.5 Ω to 10 Ω	R ranges from B) 2.5 kΩ to 10 kΩ D) 4.5 kΩ to 15 kΩ			
56.	Which of the following oscillator can be use required ?	ed where high stability of frequency is			
	A) Hartley OscillatorC) Wien Bridge Oscillator	B) Colpitt's OscillatorD) Crystal Oscillator			
57.	Find the frequency of oscillation of a Wien C = 0.0010 μ F.	Bridge Oscillator with R = 20 k Ω and			
	A) 7.96 kHz	B) 796 kHz			
	C) 790 Hz	D) 7.96 Hz			
58.	The output of an oscillator oscillates betwee	n OFF and ON stages freely, it is called			
	A) Monostable multivibrator	B) Flip-flop			
	C) Astable multivibrator	D) Schmitt trigger			
59.	A Schmitt trigger achieves hysteresis by ut A) Barkhousen's principle	ilising			
	B) Avalanche multiplication in zenor diode				
	C) Re-generate positive feedback				
	D) The magnetic property of a transformer				
60.	Which of the following criteria should be sa oscillator ?	tisfied in order to use an amplifier is an			
	A) $A\beta = 1$	B) $A\beta = 0$			
	C) $A \ge \beta$	D) $A < (1/\beta)$			
61.	Which of the following is the hexadecimal e	equivalent of the binary number			
	A) 39ACF	B) 29AF			
	C) 1EB4	D) 28AC			

62. Which of the following code is used for labelling the cells of a Karnaugh map (K-map) ?

	A) 8421 Binary	B) BCD Code			
	C) Gray Code	D) Decimal Code			
63.	The figure of merit of a logic family is often	measured in the unit of			
	A) Pico joules	B) Milli watts			
	C) Nano seconds	D) Micro volts			
64.	The decimal equivalent of the octal numbe	r 6327.4051 is			
	A) 3287.5100098	B) 3872.5100088			
	C) 3278.5100089	D) 3287.5100089			
65.	In a half adder the carry output is high, if th	e inputs are :			
	A) 000	B) 001			
	C) 111	D) 101			
66.	How many flip-flops are required to constru	ct a mod-32 counter ?			
	A) 31	B) 32			
	C) 8	D) 5			
67.	The minimum number of 2 input NAND Gat gate is	es required implementing a 2 input XOR			
	A) 5	B) 4			
	C) 6	D) 3			
68.	State the correct statement for 8051 archite	ecture.			
	A) DPTR 8 bit, PC 16 bit, CPU 8 bit, PSW 16 bit, SP 16 bit				
	B) DPTR 16 bit, PC 8 bit, CPU 8 bit, PSW 16 bit, SP 8 bit				
	C) DPTR 8 bit, PC 16 bit, CPU 8 bit, PSW	8 bit, SP 16 bit			
	D) DPTR 16 bit, PC 16 bit, CPU 8 bit, PSV	/ 8 bit, SP 8 bit			

69. After reset SP register is initialized to address

A)	8 H	B)	9 H
\sim	711		~ 1 1

C) 7 H D) 6 H

- 70. Which among the following is not a feature of RAM ?
 - A) Allows users to store multiple gigabytes of data
 - B) It can be accessed by the central processing unit
 - C) Data remains even after power supply is not present
 - D) None of the above
- 71. ROM is _____ and _____
 - A) non-volatile, temporary
 - B) non-volatile, permanent
 - C) volatile, permanent
 - D) volatile, temporary

72. In TTL family high output corresponds to

A) (0.8V to 2V	B) 2.4V to 5V
C) 2	2V to 5V	D) 0.4V to 2.4V

73. Which TTL family offers lowest power and the fastest operation ?

- A) High speed TTL
- B) Schottkey TTL
- C) Low power TTL
- D) Low power Schottkey TTL

74. In a J-K flip flop, when J = 1 and K = 1, then it will be considered as

- A) Set condition B) Toggle condition
- C) Reset condition D) No change

75. Which of the following memories uses one transistor and one capacitor as a basic memory unit ?

A)	DRAM	B) SRAM
_		

C) Both A) and B) D) NVRAM

76.	76. In the Vidicon camera tube the material which is coated on the very thin metallic film					
	called signal plate is	of na	ature.			
	A) Photo resistive		B) Photo conductive	e		
	C) Photo acoustic		D) Photo transitive			
77.	An example for audic	o file format is				
	A) Tiff	B) Jpeg	C) Gif	D) Mpeg		
78.	The woofer system th	nat is used only in the	lower part of the audio	spectrum is known as		
	A) Console		B) Speaker			
	C) Subwoofer		D) Microphone			
79.	In a DVD recording a	and playback is done	by			
	A) Laser beam for be	oth recording and pla	yback			
	B) Video head for pla	ayback and laser for I	recording			
	C) UV for playback a	and recording				
	D) IR for both record	ling and playback				
80.	In TV transmission se	eparation of sync puls	es from the composite	e video waveform is		
	done by					
	A) Differentiator circ	uit				
	B) Clipper circuit					
	C) Clamper circuit					
	D) Multivibrator circu	uit				
81.	The modulation proc	ess in which the carri	er wave is continuous	in nature is known as		
	A) Pulse modulation		B) Analog modulation	on		
	C) Pulse code modu	lation	D) None of the above	/e		
82.	In amplitude modulat	ion radio broadcast th	ne maximum modulatii	ng signal frequency		
	used is					
	A) 5 Hz	B) 5 kHz	C) 5 MHz	D) 5 Tera Hz		
83.	The circuit which is u received signal is	ised in FM receiver to	remove noise presen	it in the peak of		
	A) Clamper	B) Clipper	C) Limiter	D) Filter		

- 84. The probability density function of thermal noise is
 - A) Poisson B) Gaussian
 - C) Binomial D) Bessel
- 85. UHF range frequencies normally propagates by means of
 - A) space waves B) sky waves
 - C) normal waves D) ground waves
- 86. For tracking of satellites at very high frequency helical antennas are used due to
 - A) Ionosphere refraction
 - B) Tropospheric reflection
 - C) Internal reflection
 - D) Faraday's effect
- 87. QPSK is a modulation scheme where each symbol consists of
 - A) 4 bits
 - B) 2 bits
 - C) 1 bit
 - D) M number of bits, depending upon the requirement
- 88. The method used for demodulating FM wave is
 - A) Envelop detector
 - B) Multivibrator
 - C) Amplitude discrimination
 - D) Phase discrimination
- 89. In a linear broadside antenna array with half wave length spacing the directivity is equal to
 - A) Unity
 - B) Zero
 - C) Half of the number of elements present in array
 - D) Number of elements present in array
- 90. Which one of the following is the mode of propagation used in HF antennas ?
 - A) Ionospheric

B) Ground wave

C) Tropospheric

- D) Free space
- 91. PAM signal is detected using
 - A) Low pass filter
 - C) Band pass filter

- B) High pass filter
- D) Resistor

92.	The antenna parametA) IntensityC) Directivity	er beam width indica	tes B) D)	Gain Fading	
93.	What is the impedance A 500 Ω	e of the folded dipole	an B)	tenna ?	
	C) 300 Ω		D)	50 Ω	
94.	The charge carriers ra	andom behaviour is th	ne r	eason for the gene	eration of
	A) Shot hoiseC) Industrial hoise		в) D)	Flicker noise	
95.	In an Amplitude modu	Ilation circuit, the emi	tter	modulator amplifie	er operates in
	A) Class A mode		B)	Class C mode	
	C) Class B mode		D)	Class D mode	
96.	The number of 16-bit	timers in 8051 are			
	A) 1	B) 2	C)	3	D) 4
97.	An event that indicate	s the microcontroller	tha	t a device needs it	s service is
	A) Interrupt		B)	Paging	
	C) Segmentation		D)	None of the abov	e
98.	The number of specia	I function registers in	80	51 microcontrollers	s are
	A) 21		B)	10	
	C) 35		D)	5	
99.	In 8051 microcontrolle	er all the interrupts ar	e er	nabled or disabled	using the bit
	A) ETO		B)	ET1	
	C) EA		D)	EX1	
100. When 8051 comes on then the address 0x00 is loaded to which register ?				register ?	
	A) PSW		B)	A register	
	C) SP		D)	PC	

Space for Rough Work