BSNL(JTO) Examination 2006

SECTION-A

Q.1 A house served by a 220V supply light, is protected by a 9-Ampere fuse. The maximum number of 60 W bulbs in parallel that can be turned on is

(a) 11   (b) 33

(c) 22   (d) 44

Q.2 An n-channel JFET has $I_{DSS} = 1$ μA & $V_P = -5$V. The maximum transconductance is

(a) $g_m = 0.4$ milli mho   (b) $g_m = 0.04$ milli mho

(c) $g_m = 0.04$ mho   (d) $g_m = 0.4$ millimilli mho

Q.3 The base to base resistance of a UJT is 6 K Ohm when the emitter current is zero. If $R_{B_1} = 3.6$ K Ohm, the intrinsic stand off ratio is

(a) n = 0.66   (b) n = 0.6

(c) n = 6.0   (d) n = 3.6

Q.4 A capacitor of 1μF initially charged to 10 V is connected across an ideal inductor of 0.1 mH. The maximum current in the circuit is

(a) 0.5 A   (b) 1 A

(c) 1.5 A   (d) 2 A

Q.5 Silicon has a preference in IC technology because

(a) it is an indirect semiconductor

(b) it is a covalent semiconductor

(c) it is an elemental semiconductor

(d) of the availability of nature oxide SiO

Q.6 Three equal resistance of magnitude 5 Ohm each are connected in delta. The resistance between any two pair of terminals of the delta will be

(a) 5 Ohm   (b) 5/3 Ohm

(c) 10/3 Ohm   (d) 3/5 Ohm

Q.7 The R.M.S. value of a half wave rectified sinusoidal alternating current with peak value I_m is

(a) $I_m/1$ (b) $I_m/\sqrt{2}$

(c) $I_m/2$ (d) $I_m\sqrt{3}$

Q.8 For a series resonant circuit, at the half power points, which of the following is true?

(a) Current is half of the current at resonance.

(b) Resistance is equal to the reactance.

(c) The impedance is half the impedance at the resonance.

(d) None of the above

Q.9 The lossless line of characterstics impedance 300 Ohm is terminated in a pure resistance of 200 Ohm. The value of the standing wave ratio is

(a) 1.5   (b) 0.67

(c) 1.0   (d) 1.25

Q.10 The transient current in lossless L-C circuit when excited from an AC source is, _____ sine wave

(a) Critically damped   (b) Underdamped

(c) Overdamped   (d) Undamped

Q.11 The values of L and C for a low pass filter with cut off frequency of 2.5 KHz and operating with a terminated load resistance of 450 Ohm are given by

(a) 57.3 mH; 0.283 μF   (b) 28.66 μH; 0.14 μF

(c) 114.64 mH; 0.566 mF   (d) 50.23 mH; 0.632 mF

Q.12 The driving point impedance with poles at $\omega = 0$(zero) and $\omega = \infty$ (infinity) must have the

(a) s term in the denominator and an excess term in the numerator

(b) s term in the numerator and an excess term in the denominator

(c) s term in the numerator and equal number of terms in the numerator and denominator

(d) s term in the denominator and equal number of terms in the numerator and denominator

Q.13 A transmission line is terminated at its characterstic impedance. The reflection coefficent is

(a) 1   (b) –1

(c) 0   (d) ∞

Q.14 In the circuit shown below, the current through the $3/11\Omega$ resistance between terminals A & B is

(a) 4 Amps   (b) 1 Amp
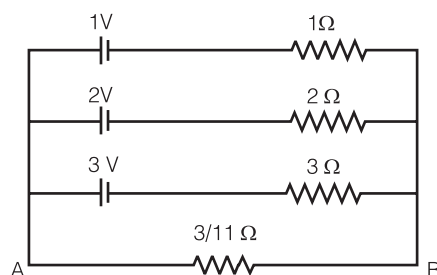
(c) 2 Amps   (d) 5 Amps

Q.15 In a series RLC circuit operating below the resonant frequency the current
   (a) I leads V_s
   (b) I lags V_s
   (c) I is in Phase with V_s
   (d) None of these

Q.16 An antenna has maximum radiation intensity U_{max} = 10 Watt/Sr and average radiation intensity U_{avg} = 4.5 Watt/Sr. If the efficiency of the antenna is given as η_r = 95%, the input power of the antenna is
   (a) 2.222 Watt
   (b) 12.11 Watt
   (c) 55.55 Watt
   (d) 59.52 Watt

Q.17 In an airport, a receiving, antenna has a maximum dimension of 3 metres and operates at 100 MHz. An aircraft approaching the airport is 1/2 Km away from the antenna . The aircraft is in the _____ region of the antenna.
   (a) far-field
   (b) near-field
   (c) close-field
   (d) Out of reach

Q.18 A lossless transmission line with characterstic impedance 500 Ohms is excited by a signal of voltage 10∠0° volts at 1.2 MHz. If the line is terminated by Z_L at a distance 1 Km, the input impedance s of the line for Z_L = ∞ (infinity) and Z_L = 0 (zero) in Ohm, respectively are
   (a) +j∞, 0
   (b) –j∞, 0
   (c) 0, – j∞
   (d) 0, +j∞,

Q.19 If the electric field of a plane wave is represented by E = $10\,\hat{y}$ cos (10^9 t+30z) volt/m, assuming ε is the dielectric constant, the corresponding magnetic field H is
   (a) $-\hat{y}$ ε 10^9/3 cos (10^9 t + 30z) Amp/m
   (b) $-\hat{x}$ ε10^9/3 cos(10^9t + 30z) Amp/m
   (c) $-\hat{z}$ ε 10^9/3 cos (10^9t + 30 z) Amp/m
   (d) $+\hat{x}$ ε 10^9/3 cos (10^9t+30z) Amp/m

Q.20 A 50 Ohm lossless line connects a signal of 200 KHz to a load of 200 Ohm. If the load power in 100 mW, the value for voltage minimum V_{min} is
   (a) $(\sqrt{20})/4$
   (b) $(\sqrt{10})/4$
   (c) $(\sqrt{20})/2$
   (d) $(\sqrt{10})/2$

Q.21 Choose the correct statement
   (a) Digital multimeters are built using current measuring elements, while analog multimeters are built using voltage measuring units
   (b) Digital multimeters are built using voltage measuring units, while analog multimeters are built using current measuring units
   (c) Both digital and analog multimeters are built using voltage measuring units
   (d) Both digital and analog multimeters are built using current measuring units

Student Notes

Q.22 An analog voltmeter has a sensitivity of 10kΩ/volt. The galvanometer used in constructing the instrument will produce a full scale deflection when the current passed through it is

(a) 10 mA   (b) 20 mA

(c) 50 mA   (d) 100 µA

Q.23 The input versus output characteristics of a digital-to-analog converter is given in the table below:

Input (bit string)	Output (in Volts)
000	0.0
010	2.1
100	4.0
110	5.9

The converter is exhibiting

(a) offset error   (b) statistical error

(c) linearity error   (d) hysteresis error

Q.24 An optical fiber cable laid underground has developed a discontinuity at a distance d from the source end. The fault can be located using the instrument

(a) Optical spectrum Analyzer (OSA)

(b) Optical Time Domain Reflectometer (OTDR)

(c) Optical Power Meter (OPM)

(d) Laser Diffractometer (LD)

Q.25 Two sinusoidal signals of the same frequency are displayed on a dual-trace oscilloscope. One complete cycle of each signal covers 6 cm of the horizontal scale and the starting point of the horizontal scale and the starting point of the two signals are separated by 0.5 cm. The phase difference between the two signals in degrees is

(a) 30   (b) 45

(c) 60   (d) 90

Q.26 Transient signals can be observed using

(a) storage oscillocope   (b) sampling oscilloscope

(c) wave analyzer   (d) spectrum analayzer

Q.27 The trace on an oscilloscope continually moves to the right of the screen when

(a) the sweep is triggered.

(b) the sweep period is larger than the signal period.

(c) the sweep period is smaller than the signal period.

(d) there is no weep.

Q.28 In a dual trace oscilloscope, the display appears segmented when

(a) low frequency signals are observed in Alternate mode

(b) low frequency signals are observed in Chop mode

(c) high frequency signals are observed in Alternate mode

(d) high frequency signals are observed in Chop mode

Student Notes

Q.29 To distinguish between signals having very close values, we need an instrument with
   (a) high accuracy
   (b) high resolution
   (c) high sensitivity
   (d) high linearity

Q.30 Match **List-I** (Instruments) with **List-II** (Measurement in which the instrument is used) and select the correct answer using the codes given below the lists:

List-I	List-II
A. Lock-in amplifier	1. Patient monitoring
B. Sampling oscillocope	2. Overcoming ground loop problem
C. Isolation amplifier	3. Phase difference between two signals
D. Strip-chart recorder	4. Signal recovery from noise
	5. Observing very high frequency signals

Codes:

	A	B	C	D
(a)	1	3	5	4
(b)	2	1	3	4
(c)	4	5	2	1
(d)	3	4	1	2

Q.31 A power diode has lightly doped n type substrate sandwiched between heavily doped p and n regions
   (a) to increase reverse breakdown voltage
   (b) to reduce ohmic loss under forward bias
   (c) to decrease switching time of the power diode
   (d) to improve transient behaviour of the diode

Q.32 An ideal thyristor is driving an R-L load of impedance Z. Input AC voltage is $V_s = V_m \sin \omega_m t$. If thyristor is fired at an input phase angle of 90°. What will be the output voltage and output current across R-L load at the instant of firing?
   (a) Output voltage is V_m and output current is V_m/Z
   (b) Output voltage and output current are both zero
   (c) Output voltage is zero and output current is delayed by an angle 90°
   (d) Output voltage is V_m and output current is zero

Q.33 In a regenerative braking, which of the following is generally true?
   (a) Back e.m.f. in the motor exceeds the applied voltage
   (b) Back e.m.f. is less than the applied voltage
   (c) Kinetic energy of the motor is dissipated in a resistance
   (d) Kinetic energy of the motor is dissipated through free wheeling diode across the motor

Q.34 A step-down chopper, fed from a 120 volt DC source, operates a DC motor whose armature e.m.f. and armature resistance are 100 volt and 0.5Ω respectively. With the magnitude control ratio 0.6, the quadrant of operation DC motor is
   (a) First
   (b) Second
   (c) Third
   (d) Fourth

Student Notes

Q.35 For IGBT, which of the following statement is true?
(a) Switching speed of IGBT is more than bipolar transistor
(b) IGBT is a current-controlled device
(c) On-state collector-emitter voltage is less than that of bipolar junction transistor
(d) It combines voltage control features of MOSFET gate and high power capability of bipolar transistor

Q.36 The semiconductor used for LEDs emitting in the visible range is
(a) GaAs
(b) GaAℓAs
(c) GalnAs
(d) GaAsP

Q.37 The polar bonds existing in III-V compound semicondutor, may be considered as equivalent to
(a) 1 ionic bond and 3 covalent bonds
(b) 1 ionic bond and 4 covalent bonds
(c) 2 ionic bonds and 2 covalent bonds
(d) 2 ionic bonds and 4 covalent bonds

Q.38 Which of the following pairs of crystal structure possesses the same atomic packing density?
(a) simple cubic & body centred cubic
(b) body centred cubic & face centred cubic
(c) face centered cubic & hexagonal close packed
(d) body centred cubic & hexagonal close packed

Q.39 The colour bands on a carbon composition resistor occur in the sequence: yellow, violet, yellow and silver. Its resistance is
(a) $470\,K\Omega \pm 47\,K\Omega$
(b) $470\,K\Omega \pm 23.5\,\%$
(c) $47\,K\Omega \pm 10\,\%$
(d) $47\,K\Omega \pm 5\,\%$

Q.40 The real & imaginary dielectric constants ε_r' and ε_r'' of 3 insulators at 1 KHz and 50° C are listed below:

Material	ε_r'	ε_r''
Polycarbonate	2.47	0.003
PET	2.58	0.003
PEEK	2.24	0.003

At a given voltage, the lower power dissipation per unit capacitance at 1 KHz can be obtained from
(a) Polycarbonate
(b) PET
(c) PEEK
(d) Insufficient information to answer

Q.41 A battery of 40 V and three capacitors of 1000 μF, 500 μF and 100 μF are all connected in (I) parallel and (II) series. The ratio of total charge stored in case I to that in case II is approximately
(a) 3 : 64
(b) 64 : 3
(c) 160 : 3
(d) 104 : 5

Student Notes

Q.42 The magnetic flux ϕ (in Weber) linked with a coil at an instant of time t(in second) is given by $\phi(t) = 2t^2 - 20t + 40$. The induced e.m.f. in the coil at the instant t =2 second is
(a) 22 V   (b) 20 V
(c) 12 V   (d) 10 V

Q.43 The speed of an audio cassette tape in a cassette player is 5cm/sec. If the maximum frequency that needs to be recorded is 20 KHz, the minimum spatial wavelength on the tape is
(a) 40 μm   (b) 25 μm
(c) 4 μm   (d) 2.5 μm

Q.44 In a power transformer, the fundamental frequency of the hum arising due to magnetostriction is
(a) equal to the line frequecy
(b) double the line frequency
(c) 4 times the line frequency
(d) not related to the line frequecny

Q.45 At a particular temperature and current density, the critical magnetic field for a Type I superconductor is B_c and that for a type II superconductor ranges from B_{c1} to B_{c2} keeping other parameters unloaded. both superconductors are now subjected to a magnetic field B that satisfies the conditions $B>B_c$ and $B_{c1} < B < B_{c2}$. Which of the following statements is then true?
(a) Both type I and Type II superconductors will switch to their normal conducting states
(b) Both Type I and Type II superconductors will maintain their superconducting states
(c) Type I superconductor will remain in superconducting state, while type II super conductor will maintain a vortex state
(d) Type I superconductor will switch to the normal conducting state, while Type II superconductor will maintain a vortex sate

Q.46 Two free charges q and 4q are placed at a distance d apart A third charge Q is placed between them at a distance X from charge q such that the system is in equilibrium. Then
(a) $Q = \dfrac{4q}{9}$, $X = \dfrac{d}{3}$ (b) $Q = \dfrac{-4q}{9}$, $X = Q = \dfrac{d}{4}$

(c) $Q = \dfrac{-4q}{9}$, $X = \dfrac{d}{3}$ (d) $Q = \dfrac{-4q}{9}$, $X = \dfrac{d}{4}$

Q.47 In order to generate electron-hole pairs, the maximum wavelength of radiation for Silicon (Band gap = 1.1 eV) is
(a) 1.88 μm   (b) 1.68 μm
(c) 1.13 μm   (d) 1.54 μm

Q.48 Resistivity of a p-type specimen is 0.12 Ω-m, hole mobility is 0.048 m^2 V^{-1} s^{-1}(electron charge = 1.6 × 10^{-19} Coulomb) and intrinsic concentration is 5.9 × 10^{10} cm^{-3}. Then the electron concentration in the specimen is
(a) 1.085 × 10^{15} cm^{-3} (b) 3.206 × 10^6 cm^{-3}
(c) 5.9 × 10^{10} cm^{-3} (d) 1.085 × 10^6 cm^{-3}

Student Notes

Q.49 What is the change of barrier height of a p-n junction at 300° K when doping in n-side is increased by a factor of 1000 and doping in p-side remains unchanged?

Hint : at 300° K $\dfrac{kT}{q} = 0.026V$

(a) 0.18 V (b) 1.8 V
(c) 0.018 V (d) 0.14 V

Q.50 A BJT has $\alpha = 0.99$, $i_B = I_B = 25\ \mu A$ and $I_{CBO} = 200\ nA$. The collector current is

(a) $I_c = 2.5\ mA$ (b) $I_c = 1.5mA$
(c) $I_c = 3.5\ mA$ (d) $I_c = 4.5\ mA$

SECTION-B

**Q.51.** Excitation table of a flip-flop is given below:

Q_n	Q_{n+1}	A	B
0	0	0	x
0	1	1	x
1	0	x	1
1	1	x	0

Characteristic equation of the flip-flop will be:

(a) $Q_{n+1} = A.\overline{Q}_n + BQ_n$ (b) $Q_{n+1} = \overline{A}.Q_n + BQ_n$

(c) $Q_{n+1} = A.\overline{Q}_n + BQ_n$ (d) $Q_{n+1} = A.\overline{Q}_n + BQ_n$

Q.52 In a weighted-resistor digital-to-analog converter with 8-bit input, if the resistance corresponding to the MSB is 2K, what will be the resistance corresponding to the LSB?

(a) 250 Ω (d) 512 KΩ
(c) 256 KΩ (d) 25.5 Ω

Q.53 The angle (θ_k) of the asymptotes of the root loci, where k = 0, 1, 2 .... n ; n = (no. of poles N) – (no. of zeroes Z) is given by

(a) $\pi k/n$ (d) $(k + 1)\ 2\ \pi/n$
(c) $2\pi k/n$ (d) $(2k + 1)\ \pi/n$

Q.54 For a 2nd order feedback control system, the peak resonance magnitude should be $M_p \le 1.15$. Hence the damping ratio (δ) is

(a) 0.1 (d) 0.5
(c) 0.707 (d) 1

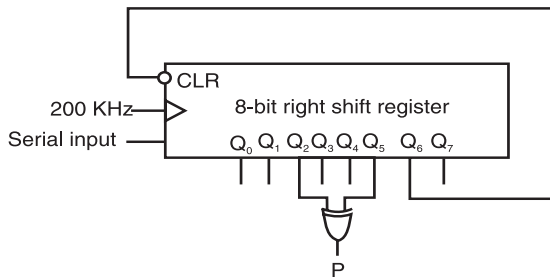**Q.55** Modulus of the following counter is

Clock
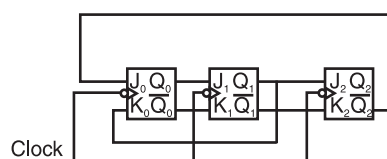
(a) 3 (b) 5
(c) 6 (d) 8

Q.56 A ripple counter is to operate at a frequency of 10 MHz. If the propagation delay time of each flip-flop in the counter is 10ns and the storbing time is 50 ns, how many maximum stages can the counter have?
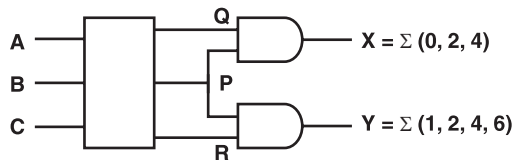
(a) 10   (b) 5

(c) 2^{10} (d) 10^2

Q.57 For the adjoining circuit, the waveform at P will be high during


(a) (0-15)μs   (b) (5-20)μs

(c) (10-25)μs   (d) (15-30)μs

Q.58 Given a combinational network with three inputs A, B and C, three intermediate outputs P, Q and R, and two outputs X = P.Q =$\sum$ (0, 2,4) and Y=P.R = $\sum$(1, 2, 4, 6) as shown below, find the smallest function P (containing minimum number of minterms that can produce the output X and Y.

(a) $\Sigma(2, 4)$ (b) $\Sigma(0, 1, 2, 4, 6)$

(c) $\Sigma (3, 5, 7)$ (d) $\Sigma(1, 2, 6)$

Q.59 If a 4-to-1 MUX (shown below) realizes a three-variable function f (X,Y,Z) = XY + $X\overline{Z}$. then which of the following is correct?
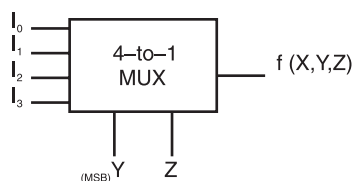
(a) I_0 = X, I_1= 0, I_2 = X, I_3 = X   (b) I_0 = 0, I_1=1, I_2 = Y, I_3 = X

(c) I_0 = X, I_1 = 1, I_2 = 0, I_3 = X (d) I_0 = X, I_1 = 0, I_2 = X, I_3 = Z

Q.60 The characteristic equation for a closed loop system with forward gain K is $s^4 + 4s^3 + 8s^2 + 6s + K = 0$. The critical gain value K_c for stability should not exceed

(a) 3.25   (b) 9.75

(c) 13.0   (d) 23.3

Q.61 Two systems are defined by their state variable equations in item domain $dx(t)/dt = Ax(t) + Bu(t)$ as follows. If the gain equations in this are as given below, which of the following choices is correct?

$$A = \begin{bmatrix} -2 & 1 \\ 0 & -1 \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 0 \end{bmatrix} \quad \text{....... Equation 1}$$

$$A = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix} \quad B = \begin{bmatrix} 0 \\ 1 \end{bmatrix} \quad \text{........ Equation 2}$$

(a) Both equations are uncontrollable
(b) Both equations are controllable
(c) Only Equation 1 is controllable
(d) Only Equation 2 is controllable

Q.62 The loop transfer of a system is $G(s) H(s) = 5/(s+1) (2s+1)(3s+1)$ which has the phase crossover frequency $f_c = 0.16$ Hz. The gain margin (dB) of the system is
(a) 6   (b) 4
(c) 2   (d) 0

Q.63 For a 2nd order servo system, the damping ratio $\delta = 0.5456$ and undamped natural frequency is $\omega_n = 31.6$ rad/sec. The percent overshoot is
(a) 7.07   (b) 10.2
(c) 14.10   (d) 21.21

Q.64 For a system with derivative feedback, forward path transfer is $G(s) = I / (s^2 + s + 1)$ and feedback path transfer is $H(s) = Ks$. What is the value of K to obtain a critically-damped closed loop transient response.
(a) 0.5   (b) 0.707
(c) 1   (d) 1.414

Q.65 A P-controller is used to adjust the outer level of a tank in range of (0-10)m. The desired level is 5 m. The controller should fully close the valve, if level rises to 5.5 m and it should fully open the valve, if level falls to 4.5 m. What should be the % P-band?
(a) 1   (b) 5
(c) 7   (d) 10

Q.66 In a radio transmitter, the frequency of the crystal oscillator will be stable for a long time if the quality factor of the crystal resonator is
(a) > 100   (b) > 500
(c) > 1000   (d) > 20000

Q.67 In an IF amplifier, the IF transformer is provided with tapping to
(a) increase the voltage gain
(b) increase the bandwidth of the resonance circuit
(c) increse the impedance offered by the resonance circuit to the following cascaded amplifier
(d) increase the quality factor of the resonance circuit

Student Notes

Q.68 Consider the wave form $V(t) = (1+m \cos\omega_m t) \cos\omega_c t$. Show that, if the demodulated wave is to follow the envelope of $V(t)$, it is required that at any time t_0

(a) $RC <= \omega_m (m\sin\omega_m t_0)/$

(b) $(I/RC) >=$

(c) $1/RC <=$

(d) RC is very large

Q.69 QPSK system is superior to BPSK system because
(a) its bandwidth is higher than that of BPSK System
(b) interchannel interference in QPSK system is less then that in BPSK system
(c) bandwidth of QPSK system is half of the bandwidth of BPSK system
(d) in QPSK system inter-symbol interference is inproved

Q.70 A radio receiver is placed at one corner of a table and again placed at some other corner of the same table. Loudspeaker output is changed because
(a) image interference is reduced
(b) adjacent channel interference is increased
(c) of fading
(d) line of sight propagation is not utilized

Q.71 In time-division multiple access system, a traffic system on the receiver side must receive the traffic burst addressed to it. For this
(a) transmitting frame acquisition is required
(b) proper synchronization of the timing of transmit frame is required
(c) frame efficiency should be higher
(d) synchronization is necessary to overcome the perturbations of the satellite

Q.72 Earth coverage dish antenna is used in satellite system. It is characterized by the fact that
(a) It is a narrow beam antenna
(b) It is Parabolic antenna
(c) it is sharply focused within a small area of the surface of the earth
(d) it is a wide angle antenna which covers a large area of the surface of the earth

Q.73 In a Klystron amplifier, the RF voltage produces
(a) amplitude modulation   (b) frequecny modulation
(c) phase modulation   (d) velocity modulation

Q.74 For the proper operation of MASER at a frequency of 10 GHz, the material used is
(a) Al_2O_3 with slight doping of chromium
(b) TiO_2 with slight doping of iron
(c) TiO_2 with slight doping of chromium
(d) Al_2O_3 with slight doping of iron

Q.75 A rectangular waveguide is 4.2 cm by 1.85 cm. The cut-off frequency of the dominant mode through this waveguide is
(a) 3.57 GHz   (b) 3.75 GHz
(c) 3.70 MHz   (d) 3.57 MHz

Q.76 For an antenna to be frequency-independent, it should expand or contract in proportion to the
(a) gain   (b) directivity
(c) wavelength   (d) impedance

Q.77 Suppose that data items, numbered 1, 2, 3, 4, 5 and 6 come in the input stream in this order. By using a queue, which of the following rearrangement can be obtained in the output order ?
(a) 1 2 6 4 5 3   (b) 2 4 3 6 5 1
(c) 4 2 1 3 5 6   (d) 1 2 3 4 5 6

Q.78 We are told that the integers between 1 and 1000 are arranged in a binary search trace with '<' as the ordering relation. Below are four lists of vertices encountered as we search for the number 363. Which list cannot be produced by this search through a binary search tree?
(a) 924, 220, 911, 244, 898, 248, 363
(b) 2, 252, 401, 398, 330, 344, 397, 363
(c) 925, 202, 911, 240, 912, 245, 363
(d) 2, 399, 387, 219, 266, 382, 381, 278, 363

Q.79 The number of 1's in the binary representation of $13 * 16^3 + 11 * 16 + 2$ is
(a) 8   (b) 7
(c) 9   (d) 12

Q.80 A disk has 500 bytes/sector, 100 sectors / track, 20 heads and 1000 cylinders. Total capacity of disk is
(a) 1 GB   (b) 100 MB
(c) 10 MB   (d) 10 GB

Q.81 Suppose that the same clock signal is used to increment the microprogram counter and to load the control register. Which of the following asseration(s) is/are true?
1. Microinstruction execution time is at least two clock periods.
2. Microinstruction exceution time can be overlapped with fetching the next microinstruction.
3. Unconditional branch microinstructions must necessarily take longer than other types.
(a) 1 only   (b) 2 only
(c) 1 and 3   (d) 2 and 3

Q.82 Some system architects do not find RISC instruction repertoire to be cost-effective because it
(a) result in large increase in programme size
(b) result in complex structure of microcode
(c) has been observed that an average compiler does not employ more than a limited subset of available instructions
(d) results in complex decoding of opcode filed resulting in longer execution time

Student Notes

Q.83 A stake machine pushes operands on a stack and evaluates binary operators by a pcs (i.e pop/compute/store) where the top two operands are popped computation is performed and the result is pushed onto stack. Evaluation of an expression $(x* y) + (u* v)$ by Reverse Polish notation in a stack machine needs
(a) 4 push and 3 pcs instructions
(b) 6 push and 1 pcs instructions
(c) 4 push and 1 pcs instructions
(d) 5 push and 2 pcs instructions

Q.84 A dot matrix printer takes 3 msec to point a character, and 1 msec for a space between two consecutive characters. If it prints 100 characters per line, its printing speed specifications in characters per second (cps) and time to print a line of characters are respectively
(a) 100 cps and 400 msec
(b) 2500 cps and 0.04 sec
(c) 250 cps and 40 msec
(d) 250 cps and 0.4 sec

Q.85 Consider the following program segment with 8085 microprocessor
LXI H 3600H
MOV A, M
HLT
The MOV instruction involves
(a) indirect addressing
(b) immediate addressing
(c) implicit addressing
(d) direct addressing

Q.86 To establish a communication between 8085 microprocessor and 8255 Programmable Peripheral Interface chip. the status of the chip select input would be
(a) TRISTATE   (b) HIGH
(b) LOW   (d) DON'T CARE

Q.87 Which flag does not change by the execution of the instruction DCR B in 8085 microprocessor ?
(a) Parity   (b) Carry
(c) Zero   (d) Sign

Q.88 Let the content of the memory location 3501H be 72H. Now consider the following program with 8085 microprocessor
LDA 3501H
CMA
STA 3502H
HLT
The content of the memory location 3502H after execution of programme will be
(a) 27H   (b) D8H
(c) 8DH   (d) 72H

Student Notes

Q.89 Given the program segment below, how many times will the instruction LP: JNZ REP be executed?

```
            MVI H, 02H
            MVI L, 05H
REP   :   DCR L
LP     :   JNZ REP
        :   DCR H
        :   JNZ REP
            ................
```

  (a) 10   (b) 260
  (c) 510   (d) 7

Q.90 What addressing mode is used in the instruction RET?
  (a) Direct   (b) Immediate
  (c) Implicit   (d) Register-indirect

Q.91 A one-byte instruction is executed in the 8085 microprocessor by the following steps:
$((SP)-1) \leftarrow (PCH)$
$((SP)-2) \leftarrow (PCL)$
$((SP) \leftarrow ((SP)-2)$
$(PC) \leftarrow 0008H$
The corresponding instruction is
 (a) JMP 0008H   (b) PUSH PSW
  (c) CALL 0008 H   (d) RST 1

Q.92 The zero flag of 8085 microprocessor is to be set keeping the content of the accumulator unchanged. Which instruction is to be used?
  (a) MOV A,A   (b) ANI 00H
  (c) XRA A   (d) CMP A

Q.93 In class - A power amplifier, the collector dissipation is maximum when
  (a) no signal is present
  (b) signal swing is maximum
  (c) signal swing is (1/1.414) of its maximum
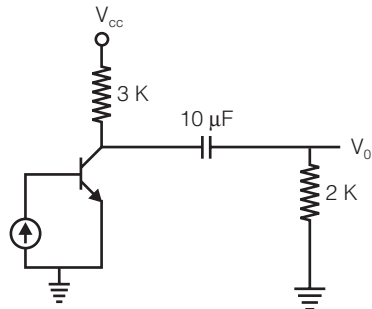 (d) none of the above

Q.94 If cut-in voltage and forward resistance of each diode (in the adjoining figure) are 0.7 V and 1 ohm respectively, the current through the 48 ohm resistor is
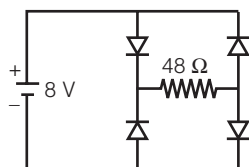
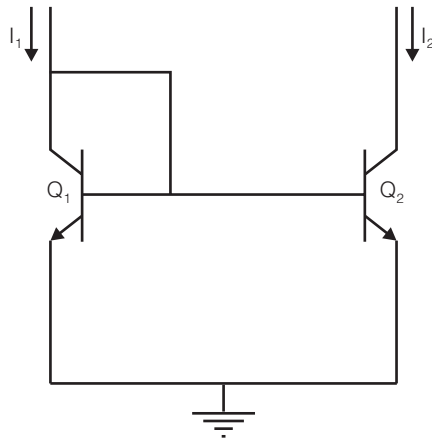 (a) 132 mA   (b) 160 mA
  (c) 0 mA   (a) (1/6) A

Student Notes

Q.95 The lower cut-off frequency of the transistor stage in the adjoining figure is
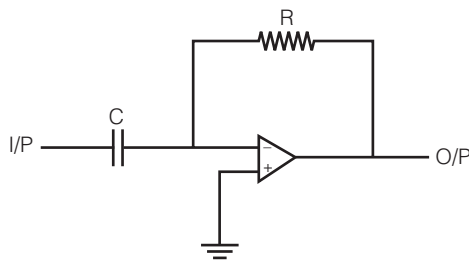

  (a) 7.95 Hz   (b) 13.25 Hz
  (c) 5.30 Hz   (d) 3.18 Hz

Q.96 In the adjoining current mirror circuit if Q_1 and Q_2 are identical and base currents are not neglected, then which of the following is true ?

  (a) $I_2 = I_1$ (b) $I_2 = \beta I_1$
  (c) $I_2 = [(\beta/(\beta +2)]I_1$ (d) $I_2 = [(\beta + 2)/\beta]I_1$

**Q.97** If rectangular input is applied to the adjoining circuit, it produces

  (a) square output   (b) spike output
  (c) sinusoidal output   (d) none of the above

Q.98 In an oscillator, if amplifier gain (A) without feedback is $(1 + R_F/R_1)$ and gain (β) of the feedback network is $1/\{3 + j(\omega Rc-1/\omega Rc)\}$, then which of the following is true ?
  (a) $R_F \leq 2R_1$ (b) $R_F \geq R_1$
  (a) $|\beta| = 3$ (b) $|\beta| = 1/3$
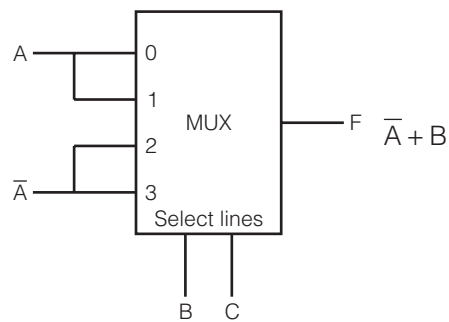
Q.99 Logic expression for Y in terms of logical variables A and B in the adjoining figure is

(a)
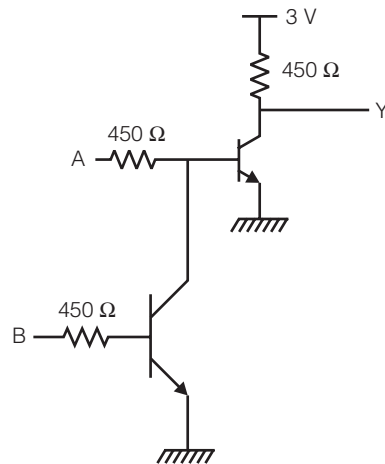
(b) $A + \bar{B}$

(c) A + B

(d) $\bar{A} + \bar{B}$

Q.100 The logic realized by the adjoining circuit is

(a) F(A, B, C) = A ⊕ B

(b) F(A, B, C) = A ⊕ C

(c) F(A, B, C) = A ⊙ B

(d) F(A, B, C) = A ⊙ C

○○○○

Answers

ANSWERS			
11. (b)	26. (a)	51. (c)	76. (d)
2. (d)	27. (c)	52. (c)	77. (d)
3. (b)	28. (d)	53. (d)	78. (c)
4. (b)	29. (b)	54. (b)	79. (b)
5. (d)	30. (c)	55. (c)	80. (a)
6. (c)	31. (d)	56. (b)	81. (d)
7. (c)	32. (d)	57. (c)	82. (a)
8. (b)	33. (a)	58. (b)	83. (a)
9. (a)	34. (a)	59. (a)	84. (d)
10. (d)	35. (d)	60. (b)	85. (d)
11. (a)	36. (d)	61. (a)	86. (c)
12. (a)	37. (a)	62. (a)	87. (b)
13. (c)	38. (c)	63. (c)	88. (c)
14. (c)	39. (c)	64. (c)	89. (a)
15. (a)	40. (b)	65. (d)	90. (d)
16. (d)	41. (d)	66. (c)	91. (c)
17. (a)	42. (c)	67. (a)	92. (d)
18. (b)	43. (d)	68. (b)	93. (a)
19. (d)	44. (b)	69. (c)	94. (a)
20. (a)	45. (d)	70. (c)	95. (c)
21. (b)	46. (a)	71. (b)	96. (c)
22. (d)	47. (c)	72. (c)	97. (b)
23. (a)	48. (b)	73. (d)	98. (d)
24. (b)	49. (a)	74. (b)	99. (d)
25. (a)	50. (a)	75. (a)	100 (a)