BSNL JTO- Telecom Model Exam Paper 2009

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 IDSS = 1 μA & VP =-5V. The maximum transconductance is
(a) gm = 0.4 milli mho (b) gm = 0.04milli mho
(c) gm = 0.04 mho (d) gm = 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 RB1 = 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 Im is
(a) Im/1 (b) mI / 2
(c) mI /2 (d) mI 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 ? = 0(zero) and ? = 8 (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) 8

Q.14 In the circuit shown below, the current through the 3/11Ω 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 Vs (b) I lags Vs
(c) I is in Phase with Vs (d) None of these

Q.16 An antenna has maximum radiation intensity Umax = 10 Watt/Sr and average radiation intensity Uavg = 4.5 Watt/Sr. If the efficiency of the antenna is given as ?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 ZL at a

distance 1 Km, the input impedance s of the line for ZL = 8
(infinity) and ZL = 0 (zero) in Ohm, respectively are
(a) +j8, 0 (b) −j8, 0
(c) 0, − j8 (d) 0, +j8

Q.19 If the electric field of a plane wave is represented
by E = 10 yˆ cos (109 t+30z) volt/m, assuming e is the
dielectric constant, the corresponding magnetic field H is
(a) − ˆy e 109/3 cos (109 t + 30z) Amp/m
(b) − ˆx e109/3 cos(109t + 30z) Amp/m
(c) − ˆz e 109/3 cos (109t + 30 z) Amp/m
(d) + ˆx e 109/3 cos (109t+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 Vmin is
(a) (20)/4 (b) (10)/ 4
(c) (20)/ 2 (d) (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

Q.22 An analog voltmeter has a sensitivity of 10kO/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:
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

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 Vs = Vm sin ?mt. 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 Vm and output current is Vm/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 Vm 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 0.5O respectively. With the magnitude control ratio 0.6, the quadrant of operation DC motor is
(a) First (b) Second
(c) Third (d) Fourth

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 KO ± 47 KO (b) 470 KO ± 23.5 %
(c) 47 KO ± 10 % (d) 47 KO ± 5 %

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

Q.42 The magnetic flux f (in Weber) linked with a coil at
an instant of time t(in second) is given by f(t) = 2t2 –
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 Bc
and that for a type II superconductor ranges from Bc1 to
Bc2 keeping other parameters unloaded. both superconductors
are now subjected to a magnetic field B that satisfies the
conditions B>Bc and
Bc1 < q ="4q9," x ="d3" q ="-4q9," x ="dQ4="" q ="-4q9," x
="d3" q ="-4q9," x ="d4" gap =" 1.1" charge =" 1.6" a ="
0.99," ib =" lB" icbo =" 200" ic =" 2.5" ic =" 1.5mA" ic ="
3.5" ic =" 4.5" 1 =" A.Qn" 1 =" A.Qn+" 1 =" A.Qn" 1 ="
A.Qn" k =" 0," n =" (no." mp =" 1.15." x =" P.Q" y="P.R" i0
=" X," i1=" 0," i2 =" X," i3 =" X" i0 =" 0," i1="1," i2 ="

Y," i3 =" X" i0 =" X," i1 =" 1," i2 =" 0," i3 =" X" i0 ="
X," i1 =" 0," i2 =" X," i3 =" Z" k =" 0." dt =" Ax(t)" a
="-2" b ="10" a ="0" b ="0" fc =" 0.16" d =" 0.5456" n ="
31.6"
(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

Q.68 Consider the wave form V(t) = (1+m cos?mt) cos?ct.
Show that, if the demodulated wave is to follow the
envelope of V(t), it is required that at any time t0
(a) RC <=?m(msin?mt0) / (1+mcos?m t0)
(b) (I/RC) >= ?m(msin?mt0) / (1+mcos?m t0)
(c) 1/RC <= 1/(m?m)
(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) Al2 O3 with slight doping of chromium
(b) Ti O2 with slight doping of iron
(c) Ti O2 with slight doping of chromium
(d) Al2 O3 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*
163 +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

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* ?) 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

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) ? (PCH)
((SP) −2) ? (PCL)
((SP) ? ((SP)-2)
(PC) ? 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
8 V

+ 48 O
−

(a) 132 mA (b) 160 mA
(c) 0 mA (a) (1/6) A

Q.95 The lower cut-off frequency of the transistor stage in the adjoining figure is
Vcc
3 K
10 µF
V0
2 K
(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 Q1 and Q2 are identical and base currents are not neglected, then which of the following is true ?
I1 I2
Q1 Q2
(a) I2 = I1 (b) I2 = ßl1
(c) I2 = [(ß/(ß +2)]I1 (d) I2 = [(ß + 2)/ß]I1

Q.97 If rectangular input is applied to the adjoining circuit, it produces
R
C
I/P O/P −
+
(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 + RF/ R1) and gain (ß) of the feedback network is 1/{3 + j(?Rc−1/?Rc)}, then which of the following is true ?
(a) RF = 2R1 (b) RF = R1
(a) |ß| = 3 (b) |ß| = 1/3