

4039

BHARAT SANCHAR NIGAM LIMITED

MAHARASHTRA TELECOM CIRCLE
DIRECT RECRUITMENT OPEN COMPETITIVE EXAMINATION
(RECRUITMENT YEAR 2008)

PAPER - I
(Part-I, Part-II & Part-III)

Subject:- General Ability, Basic Engineering and Specialization

Time allowed:- 3 hours

Max.Marks:- 200

INSTRUCTIONS:- Please read following instructions carefully:

1. Attempt all 200 (Two hundred) questions (Objective Type). This Question Paper contains 3 parts viz: (Part-I - General Ability, 20 Questions (20 Marks), Part-II - Basic Engineering, 90 Questions (90 Marks) & Part-III - Specialization, 90 Questions (90 Marks).
2. All Questions carry equal marks (1 Mark each).
3. There is Negative marking. Negative marking will be $\frac{1}{4}$ Mark deducted for each wrong Answer. This must be carefully noted by the candidates.
4. All the Questions should be attempted either in English or in Hindi medium only.
5. Write your Roll No. on the top of first page of your Answer Book. Do not write your name anywhere in the Answer Book.
6. All rough work should be done on the last page/pages of your Answer Book. Cancel all such rough work by drawing prominent lines across it.
7. Any cutting/overwriting will not be allowed against any question attempted by the candidate.
8. Tick (✓) must be done neatly and clearly with the Black Ball Point Pen.
9. Use of calculator, slide rule and mobile etc. is not permitted in the Examination Hall.
10. In case of any doubt, difference or discrepancy between the 2 versions (English/Hindi medium) of Question Paper, the English version shall prevail. This Question Paper contains _____ Pages.

PSC

PART - I**GENERAL ABILITY TEST****State True/False in the box with tick mark (✓)**

- Q1. Indian Military Academy is situated at Dehradun (True/False)
 Q2. "Antigen" was invented by Henry Sterling (True/False)
 Q3. "Bihu" is a famous festival of Orissa (True/False)
 Q4. "Kanha Park" is situated in M.P. (True/False)
 Q5. Least rain fall is in Leh (True/False)

Find out the correct answers of the following with tick mark (✓):

- Q6. "Man & Superman" was written by:
 (a) R.N. Tagore (b) Marx Charles
 (c) J. Bernard Shaw (d) Tolstoy
- Q7. The function of DNA in the body is:
 (a) To control food process and help in appetisation
 (b) To assist in release of energy
 (c) To control the heredity
 (d) To help in synthesis of proteins
- Q8. Next Commonwealth games will be held in New Delhi:
 (a) 2009 (b) 2012 (c) 2011 (d) 2010
- Q9. Which of the following is a metal?
 (a) Arsenic (b) Carbon (c) Carbon dioxide (d) Potassium
- Q10. When was first Five Year Plan Launched:
 (a) 1st April 1949 (b) 1st April 1950
 (c) 1st April 1951 (d) 1st May 1949

Contd.....2/-

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Choose correct prepositions for filling up following sentences:

- Q11. Pappu fell..... the river
(a) by (b) in (c) into (d) on
- Q12. Allahabad is faraway..... Jammu
(a) at (b) within (c) of (d) from
- Q13. My father has died..... cancer ailment recently
(a) off (b) at (c) in (d) of
- Q14. Prime Minister of India is appointed..... the President of India
(a) for (b) by (c) with (d) from
- Q15. Please keep your books..... the table
(a) at (b) for (c) of (d) on

Find out the correct SYNONYMS of the following:

- Q16. APPLAUD
(a) beg (b) clapping (c) pray (d) clap
- Q17. EFFECT
(a) resulting (b) resulted (c) mistake (d) mistaken
- Q18. COMPREHEND
(a) decided (b) agreeing (c) understanding (d) understand
- Q19. REMUNERATION
(a) penalty (b) compensation (c) compromising
(d) indebtedness
- Q20. DEFER
(a) indifference (b) delaying (c) postpone
(d) estimating

PART - II**BASIC ENGINEERING**

- Q1. The represent number 35 in binary, number of bits required is:
 (a) 6 (b) 5 (c) 4 (d) 33
- Q2. The 1's complement of the number 1101 is
 (a) 1101 (b) 0010 (c) 0000 (d) 0011
- Q3. Which of the following flip-flop is used as latch?
 (a) JK flip-flop (b) D flip-flop
 (c) RS flip-flop (d) T flip-flop
- Q4. A gate in which all inputs must be low to get a high out is called
 (a) An Inverter (b) A NOR gate
 (c) An AND gate (d) A-NAND gate
- Q5. How many lines are there in address bus of 8085 μ P?
 (a) 6 (b) 8 (c) 12 (d) 16
- Q6. A four-bit number is given as 1001. Its one's complement is
 (a) 1001 (b) 1110 (c) 0110 (d) 0111
- Q7. In magnetic film memory, the memory element consists of
 (a) Plated wires (b) Super conductive material
 (c) Nickel iron alloy (d) Doped aluminium
- Q8. A binary with n digits all of which are unity has the values
 (a) n^2-1 (b) 2^n
 (c) $2^{(n-1)}$ (d) 2^n-1

Contd...2/-

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- Q9. The purpose of introducing feedback loop in a digital counter circuit is
- To improve stability
 - To improve distortion
 - Synchronises input and output pulses
 - To reduce the number of input pulses to reset the counter
- Q10. The frequency of the square wave in Hz generated by an astable multivibrator is given by
- $1/0.69 RC$
 - $1/1.38 RC$
 - $0.69/RC$
 - $1.38/RC$
- Q11. To implement all functions of the basic logic function, it suffices to have:
- OR
 - NOT
 - ANDNOT
 - None of these
- Q12. The NMOS inverter using depletion type NMOS for load
- Has sharper transfer characteristic
 - Uses larger silicon area in fabrication
 - Has increased noise margin
 - Has slower speed compared to enhancement type of load
- of these the true statements are
- a,b
 - a,c
 - b,d
 - c,d
- Q13. In order to use nor gate as inverter
- All its inputs are tied together
 - All its inputs are kept open
 - Each input is used as an inverter input
 - None of these
- Q14. In sequential circuits, the output states are function of
- Present input states
 - Past input states
 - Present and past input
 - None of these

Contd.....3/-

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Q15. The equations $x^2 + bx + c = 0$ and $x^2 + dx + e = 0$ have common roots if

- (a) $b^2c = d^2e$ (b) $b^2e = d^2c$
(c) $be = cd$ (d) $bd = ce$

Q16. If $x = 9 + 4\sqrt{5}$, then the value of $\frac{x-1}{\sqrt{x}}$ is

- (a) 1 (b) 0 (c) 2 (d) 4

Q17. The current logging takes place in

- (a) RTL (b) HTL
(c) DCTL (d) TTL

Q18. A ring counter is same as

- (a) Up-down counter (b) Parallel counter
(c) Shift register (d) None of these

Q19. A secondary memory is

- (a) Always volatile
(b) Always costlier than primary memory
(c) Always slower than primary memory
(d) None of these

Q20. The value of $\int_0^{\pi/2} \cos x \, dx$ is

- (a) 0 (b) -1 (c) 1 (d) 2

Q21. $\int \log_e x \, dx$ equals

- (a) $x \log_e x + c$ (b) $x \log_e (x/e) + c$
(c) $x \log_e (xe) + c$ (d) None of these

Q22. If $f(x) = 1/5x - 7/5$, then $f''(x)$ is

- (a) $5x - 7$ (b) $5x + 7$
(c) $-5x - 7$ (d) $-5x + 7$

Contd.....4/-

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Q23. If $A = \{1, 2, 3\}$ and $B = \{c, d\}$, then the number of functions from A to B is

- (a) 3 (b) 5 (c) 8 (d) 10

Q24. 1 Radian is equal to

- (a) $57^{\circ} 17' 45''$ (b) $57^{\circ} 18' 46''$
(c) $57^{\circ} 20' 44''$ (d) $57^{\circ} 22' 48''$

Q25. The value of $\cos 150^{\circ} + \sin 105^{\circ}$ is

- (a) $\frac{1}{2}$ (b) None (c) 1 (d) 2

Q26. The length of the tangent from (5, 1) to the circle $(x+3)^2 + (y-2)^2 = 16$ is

- (a) 81 (b) 29 (c) 21 (d) 7

Q27. The equation of the tangent at the origin to the circle $x^2 + y^2 + 2gx + 2fy = 0$ is

- (a) $fx + gy = 0$ (b) $gx + fy = 0$
(c) $fx - gy = 0$ (d) $gx - fy = 0$

Q28. The equation of the straight line which is perpendicular to the line $y = x$ and passes through (3, 2) is given by

- (a) $x - y - 5 = 0$ (b) $x + y - 5 = 0$
(c) $x + y - 1 = 0$ (d) $x - y - 1 = 0$

Q29. Three consecutive vertices of a parallelogram ABCD are A(3, 0), B(5, 2) and C(-2, 6) then the coordinates of the fourth vertex D are:

- (a) (0, 0) (b) (-2, 2) (c) (-4, 4) (d) (-4, -4)

Q30. The three points (3, 2), (7, 4), $(5 + \sqrt{3}, 3 - 2\sqrt{3})$, form

- (a) a scalene triangle (b) equilateral triangle
(c) isosceles triangle (d) right-angled triangle

Q31. If the vertices of a triangle are (3, 4), (-5, 6), (8, -3), then its area is

- (a) 10 sq. units (b) 15 sq. units
(c) 18 sq. units (d) 23 sq. units

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141-7 (Eng.)

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Q32. The area bounded by $y = 4 - x^2$ and $y = 0$ is

- (a) $8/3$ (b) $16/3$ (c) $32/3$ (d) $64/3$

Q33. A particle acted on by constant forces $4\hat{i} + \hat{j} - 3\hat{k}$ and

$3\hat{i} + \hat{j} - \hat{k}$ is displaced from the point $\hat{i} + 2\hat{j} + 3\hat{k}$ to the point

$5\hat{i} + 4\hat{j} + \hat{k}$, then the total work done is

- (a) 10 units (b) 20 units
(c) 30 units (d) 40 units

Q34. The value of $\cos 105^\circ + \sin 105^\circ$ is

- (a) $1/\sqrt{2}$ (b) $1/2$ (c) 1 (d) $\sqrt{2}$

Q35. In center tap full wave rectifier, 50V is the peak voltage between the center tap and one of the ends of the secondary. The maximum voltage across the reverse biased diode will be

- (a) 100V (b) 72V (c) 50V (d) 38V

Q36. In a transistor amplifier, $I_{CQ} = 5$ mA and ac collector current of 1mA peak flows into a load of 1K. The average dc power dissipated in the load is

- (a) 0.5 mW (b) 1 mW (c) 6.25 mW (d) 25 mW

Q37. In a zener diode

- (a) Forward voltage rating is high
(b) Negative resistance characteristic exists
(c) Sharp breakdown occurs at low reverse voltage
(d) None of the above.

Q38. Bridge rectifiers are preferred because

- (a) They require small transformer
(b) Less peak inverse voltage
(c) (a) and (b) both
(d) None of these

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- Q39. In case of indirectly heated tubes the heater filament is usually made of
 (a) Manganin (b) Tungsten (c) Invar (d) Any of the above
- Q40. Which of the following are typical resistance and power dissipation values of a carbon composition resistor
 (a) 100 K, 1 W (b) 5Ω, 5 w
 (c) 10 k, 10 w (d) 1 k, 100 w
- Q41. Which of the Kanthal, Manganin, Nichrome and Tantenium has highest resistivity
 (a) Kanthal (b) Manganin
 (c) Nichrome (d) Tantenium
- Q42. The typical turn off time of a transistor is
 (a) 10 n sec (b) 60 n sec
 (c) 70 n sec (d) 40 n sec
- Q43. In a Metal
 (a) The electrical conduction is by electron and holes
 (b) With rise in temperature, the conductivity decreases
 (c) The conduction band is empty
 (d) There is a small energy gap between the two bands
- Q44. A transistor has $h_{fe} = 50$, then h_{fc} will be
 (a) -50 (b) +50 (c) -51 (d) +51
- Q45. A constant current signal across a parallel RLC circuit given on output of 1.4 Volts at the signal frequencies of 3.9 KHz and 4.1 KHz. At the frequency of KHz, the output voltage will be
 (a) 1 Volt (b) 2 Volts (c) 1.4 Volts (d) 2.8 Volts
- Q46. The properties of JEET resemble those of
 (a) Thermionic valves

Contd....7/-

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- (b) NPN transistors
- (c) PNP transistors
- (d) Unijunction transistor

Q47. An ideal current controlled voltage source has

- | | |
|--------------------|----------------|
| (a) $R_i = \infty$ | $R_o = \infty$ |
| (b) $R_i = 0$ | $R_o = \infty$ |
| (c) $R_i = 0$ | $R_o = 0$ |
| (d) $R_i = \infty$ | $R_o = 0$ |

Q48. For an ideal noise free transistor amplifier, the noise factor is

- (a) Zero
- (b) 1 dB
- (c) Depends upon circuit parameters
- (d) Zero dB

Q49. In the RC phase shift oscillator

- (a) The β network introduces a phase change of 180°
- (b) The β network introduces a phase of 360°
- (c) The amplifier gain has to be a positive number
- (d) $A\beta$ should be -1

Q50. Which of the following is a poorest insulator

- (a) Bakelite
- (b) Rubber
- (c) Lucite
- (d) Polyethylene

Q51. When a low resistance is connected in parallel with a high resistance, the combined resistance is

- (a) Always more than the high resistance
- (b) Always less than the low resistance
- (c) Always between the value of high and low resistance
- (d) Either lower or higher than low resistance depending on the value of high resistance

Q52. The resistance of a copper wire to the flow of current through it

- (a) Decreases as the diameter of the wire decreases
- (b) Increases as the diameter of the wire increases
- (c) Decreases as the length of the wire increases
- (d) Increases as the length of the wire increases

Contd....8/-

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- Q53. The insulation resistance of a cable is $300\text{M}\Omega/\text{km}$. Its value for 250 meter length is $\text{--M}\Omega$
- (a) 1200 (b) 75 (c) 600 (d) 150
- Q54. A coil has a resistance of 100Ω at 90°C . At 100°C , its resistance of is 101Ω . The temperature-coefficient of the wire at 90°C is
- (a) 0.01 (b) 0.1 (c) 0.0001 (d) 0.001
- Q55. The factor which will have least effect on the voltage at the load end of a two-wire supply circuit is
- (a) Length of the circuit
(b) Whether supply frequency is 25 Hz or 50 Hz
(c) Amount of load on the circuit
(d) Cross-section of the circuit wires
- Q56. If velocity of sound in air is 340 m/s then the main frequency of open 50 cm long organ pipe will be
- (a) 170 Hz (b) 340 Hz (c) 510 Hz (d) 680 Hz
- Q57. Which of the following does not transfer the energy
- (a) transvers waves (b) longitudinal waves
(c) non progressive wave (d) electromagnetic waves
- Q58. If a lens of glass having refractive index at $3/2$ is dipped in water having refractive index $4/3$ then the focal length
- (a) Increases (b) Decreases
(c) Unchanged (d) Cannot decide on above detail
- Q59. Two lens having power's 4D and -2D are in contact then combined focal length of two is
- (a) 50 cm (b) 75 cm (c) 25 cm (d) 1 m
- Q60. Two thin lens are in contact with each other one lens is having focal length of 20 cm if the focal length of combination is 12 cm then focal length of other lens is

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- (a) 15 cm (b) 25 cm (c) 20 cm (d) 30 cm
- Q61. When a convex lens of focal length 40 cm and a convex lens of 25 cm are brought in contact with each other then power of combination of these two
- (a) -6.5 D (b) +6.5 D (c) -1.5 D (d) +6.67 D
- Q62. The velocity of light in air is 3×10^8 m/s. The velocity of light in glass having refractive index 1.5 is
- (a) 1.5×10^8 m/s (b) 2.0×10^8 m/s
(c) 1.0×10^8 m/s (d) 2.5×10^8 m/s
- Q63. The refractive index for glass is 1.5 for the light of wave length 6000\AA then the wave length of this light in glass is
- (a) 6000\AA (b) 9000\AA (c) 4000\AA (d) 400\AA
- Q64. Which one of the following is electromagnetic in nature
- (a) Sound waves (b) Heat waves and infrared
(c) Water waves (d) waves produced in corel
- Q65. Polarisation in light express
- (a) Longitudinal nature (b) Transverse nature
(c) Partical nature (d) none of the above
- Q66. What we use to prepare polarized light
- (a) Prism of flint glass (b) NaCl Crystal
(c) Nicol Prism (d) BI Prism
- Q67. Number of emission spectrum lines in the hydrogen spectrum when electron goes from ground state
- (a) 2 (b) 3 (c) 4 (d) 6
- Q68. Lyman series of Hydrogen spectrum belongs to which part of electromagnetic radiations
- (a) Infrared (b) Visible
(c) Ultraviolet (d) Far-red

Contd.....10/-

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- Q69. The power dissipated in a 500-mV, 10,000 Ω shunt of a dc panel ammeter is watt
 (a) 5 (b) 50 (c) 500 (d) 5000
- Q70. A high potential is applied to the final anode of a cathode-ray tube in order to
 (a) Increase tube sensitivity
 (b) Eliminate secondary emission from screen
 (c) Increase beam current
 (d) Accelerate electrons to a high velocity
- Q71. A 'trimmer' capacitor is a variable capacitor used for
 (a) 'Tuning up' a radio for best sensitivity
 (b) Tuning a radio to different stations
 (c) Changing the original capacitance by several hundred Pico farads
 (d) Eliminating whistling in a transistor radio
- Q72. A steel bar needs 1200 AT to magnetise it. The voltage that must be applied to the magnetizing coil of 100 turns and 10Ω resistance is - volt.
 (a) 120 (b) 1.2 (c) 1200 (d) 10
- Q73. The voltage induced in a loop of wire rotating in a strong and steady magnetic field is
 (a) Pulsating DC (b) DC (c) Rectified AC (d) AC
- Q74. Hysteresis loss can be minimized by selecting a magnetic material having
 (a) Large B/H loop area (b) High resistivity
 (c) High retentivity (d) Low hysteresis coefficient
- Q75. A conductor of length 1 meter moves at rt., angles to a magnetic field of flux density 1 Wb/m^2 with a velocity of 25 m/s, the induced e.m.f. in the conductor will be - volt
 (a) 25 (b) 50 (c) 75 (d) 100

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141-12 (Eng.)

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- Q76. A lead-acid battery having a 100 Ah capacity is 25% charged. After being charged at 10 A for 5 hours, it will be approximately - charged
 (a) $\frac{1}{2}$ (b) $\frac{3}{4}$ (c) fully (d) over
- Q77. A series R-C circuit having $R = 5\Omega$ and $C = 100\mu\text{F}$ has a time constant of
 (a) $20\mu\text{s}$ (b) $5 \times 10^{-6}\text{s}$
 (c) 0.005 s (d) 500 s
- Q78. A capacitor of $1\mu\text{F}$ is charged to 100 V and then disconnected from the power supply. Another uncharged capacitor of $3\mu\text{F}$ is now connected across it. The common voltage across the combination is volt
 (a) 25 (b) 75 (c) 33.3 (d) 50
- Q79. A 15-A fuse is found open and the servicer has no replacement but has a choice between 10A and 30A fuse. He should use
 (a) 10A fuse (b) 30-A fuse
 (c) either (a) or (b) (d) both (a) and (b)
- Q80. When connecting watt meters to a load circuit consuming large current, it is necessary to use
 (a) Potential transformers (b) Isolation transformers
 (c) Power shunts (d) Current transformers
- Q81. A conductor of length 1 meter moves at rt. Angles to a magnetic field of flux density 1 Wb/m^2 with a velocity of 25 m/s . The induced e.m.f. in the conductor will be - volt.
 (a) 25 (b) 50 (c) 75 (d) 100
- Q82. Plank constant has the same dimensions as that of
 (a) Work (b) Power
 (c) Linear momentum (d) Angular momentum
- Q83. Dimension ML^2T^{-2} is at which physical quantity
 (a) Force (b) Surface tension
 (c) Torque (d) Elasticity coefficient

Contd....12/-

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Q84. When electron combines with its antiparticle

- (a) Generates Heavy particle (b) Generates lighter particle
(c) Generates photon (d) None of the above

Q85. The ratio of power's of 10 of volume atom and volume of nuclear of the order

- (a) 10^{25} (b) 10^{15} (c) 10^{10} (d) 10^{13}

Q86. If electron jumps from 3^{rd} shell to 2^{nd} shell in case of hydrogen then the wave length of emitted radiations is

- (a) $5R/36$ (b) $R/6$ (c) $36/5R$ (d) $6/R$

Q87. Fraunhoffer lines are example of

- (a) Continuous spectrum (b) Band spectrum
(c) Absorption spectrum (d) Emission spectrum

Q88. The hot-wire ammeter

- (a) Is used only for dc circuits
(b) Is a high precision instrument
(c) Is used only for ac circuits
(d) Reads equally well on dc and ac circuits

Q89. The electrical conductivity of the materials varies over wide range of

- (a) 17 orders of magnitude
(b) 19 orders of magnitude
(c) 23 orders of magnitude
(d) 25 orders of magnitude

Q90. For which of the following types of capacitors, colour coding is not used to specify the value?

- (a) Paper Capacitor (b) Ceramic capacitor
(c) Mica capacitor (d) Electrolyte capacitor

PART - III
SPECIALISATION

- Q1. In moving coil meters, damping is provided by
(a) aluminium frame
(b) damping vane
(c) damping vane in an air-tight chamber
(d) none of these
- Q2. Moving coil instrument can be used for measurement at
(a) high frequencies
(b) low frequencies
(c) only dc
(d) both dc & ac
- Q3. Q-factor of a coil is measure of its
(a) selectivity
(b) retentivity
(c) resistivity
(d) self inductance
- Q4. Carbon brushes are used in electric motors to
(a) prevent sparking during commutations
(b) provide a path for flow of current
(c) brush off carbon deposits on the commutator
(d) none of these
- Q5. A dc motor can be easily identified by
(a) yoke
(b) size of conductor
(c) commutator
(d) winding
- Q6. The armature of a dc motor is laminated
(a) to reduce hysteresis loss
(b) to reduce eddy current loss
(c) to reduce the cost of core
(d) to reduce the mass of the armature

Contd...2/-

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Q7. An ideal transformer is one which has

- (a) a common core for its primary and secondary windings
- (b) core of stainless steel and winding of pure copper wire
- (c) no losses and magnetic leakage
- (d) interleaved primary and secondary windings

Q8. Percentage slip s of an induction motor is defined as

- (a) $S = \frac{N_s - N}{N_s} \times 100$
- (b) $S = \frac{N - N_s}{N} \times 100$
- (c) $S = \frac{N - N_s}{N_s} \times 100$
- (d) $S = \frac{N_s - N}{N} \times 100$

Q9. Which of the following relation gives the synchronous speed N of an induction motor, where f =frequency, p =number of pair of poles

- (a) $N_s = p.f.$
- (b) $N_s = 60 f/p$
- (c) $N_s = 60 p/f$
- (d) $N_s = pf/60$

Q10. Heat balance in a boiler furnace is improved by sending air to the furnace

- (a) at low temperature
- (b) at high temperature
- (c) mixed with CO
- (d) both (b) & (c)

Q11. The wave length of microwaves at 100 GHz will be

- (a) 3 cm
- (b) 0.3 cm
- (c) 0.03 cm
- (d) 0.003 cm

Q12. A sinusoidal voltage of amplitude 1 KV is amplitude modulated by another sinusoidal voltage to produce 30% modulation. The amplitude of each sideband term is

- (a) 300 volts
- (b) 150 volts
- (c) 500 volts
- (d) 250 volts

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Q13. The bandwidth requirement of a telephone channel is

- (a) 3 Hz (b) 5 kHz (c) 10 Hz (d) 15 KHz

Q14. In frequency modulation, if the frequency of the modulating voltage is doubled, the rate of deviation of carrier frequency

- (a) doubles (b) becomes four times
(c) become half (d) remaining unaltered

Q15. In FM, the carrier frequency deviation is determined by

- (a) modulating voltage (b) modulating frequency
(c) both modulating voltage & frequency (d) none of these

Q16. An amplitude modulated voltage has modulation index of 100%. If the carrier is suppressed, the percentage power saving is

- (a) 50% (b) 66.6% (c) 75% (d) 25%

Q17. A carrier is simultaneously amplitude modulated by two sine waves causing individual modulation of 30% and 40%. The overall modulation index is

- (a) 50% (b) 35% (c) 70% (d) 40%

Q18. De-emphasis is used

- (a) to attenuate high modulation frequencies
(b) to attenuate low modulation frequencies
(c) to attenuate midband modulation frequencies
(d) to reduce overall modulation index

Q19. For transmission of the normal speech signal, the PCM channel needs a bandwidth of

- (a) 64 kHz (b) 16 kHz (c) 8 kHz (d) 32 kHz

Q20. In PCM with 16 quantizing levels, the number of pulses in a code group will be

- (a) 16 (b) 8 (c) 6 (d) 4

Contd....4/-

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- Q21. In PCM for q quantizing levels, the number of pulses p in a code-group is given by
 (a) $\log_2 q$ (b) $\log_2 q$ (c) $\ln q$ (d) $2 \log_2 q$
- Q22. In pulse modulation system, the modulating signal controls the
 (a) pulse amplitude (b) pulse width
 (c) pulse spacing (d) all of these
- Q23. In PCM for 128 standard quantizing levels, the maximum error will be
 (a) $1/128$ of the total amplitude range
 (b) $1/256$ of the total amplitude range
 (c) $1/64$ of the total amplitude range
 (d) $1/32$ of the total amplitude range
- Q24. The bandwidth needed for transmitting 4 kHz signal using PCM with 128 quantizing levels is
 (a) 4 kHz (b) 16 kHz (c) 28 kHz (d) 64 kHz
- Q25. Which system is free from noise?
 (a) FM (b) AM (c) Both (a) & (b) (d) None of the above
- Q26. The gain of a TWT is proportional to
 (a) length of tube (b) type of input and output coupling
 (c) none of above (d) both (a) & (b)
- Q27. The skin effect causes current to flow
 (a) in the centre of the conductor
 (b) near the surface of the conductor
 (c) through central core
 (d) uniformly through the conductor
- Q28. In communication the sampling technique leads to
 (a) higher efficiency (b) higher speed of communication
 (c) cheaper equipment (d) all of these

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Q29. A 2.5 volt 500 Hz voltage frequency modulates the carrier to cause frequency deviation of 5 kHz. The modulation index is
(a) 10 (b) 25 (c) 5 (d) 50

Q30. TDM

- (a) can be used with PCM only
- (b) interleaves pulses belonging to different transmissions
- (c) combine fine groups into a super group
- (d) stacks 24 channels in adjacent frequency slots.

Q31. The reflection coefficient on a lossless transmission line

- (a) is always purely imaginary
- (b) is always purely real
- (c) is always complex
- (d) can be any way

Q32. Indicate the false statement. The SWR on a transmission line is infinity, the line is terminated in

- (a) a short circuit
- (b) a complex impedance
- (c) an open circuit
- (d) a pure reactance

Q33. A signal propagated in a waveguide has a full wave of electric intensity change between the two further walls, and no component of the electric field in the direction of propagation. The mode is

- (a) TE 1,3
- (b) TE 1,0
- (c) TM 2,2
- (d) TE 2,2

Q34. The characteristic impedance is given by

- (a) $Z_0 = Z_{sc}/Z_{oc}$
- (b) $Z_0 = Z_{oc}/Z_{sc}$
- (c) $Z_0 = Z_{oc} \cdot Z_{sc}$
- (d) $Z_0 = 1/Z_{oc}/Z_{sc}$

A low transmission line of 100 ohm characteristic impedance is connected to a load of 200 ohm:-

Q35. Calculate the voltage reflection coefficient?

- (a) 1/2
- (b) 1/3
- (c) 1/4
- (d) 1/5

A low transmission line of 100 ohm characteristic impedance is connected to a load of 200 ohm:-

Q36. Standing wave ratio will be

- (a) 2
- (b) 3
- (c) 4
- (d) 5

Contd....6/-

....6....

Q37. Wave guides are used mainly for microwave signal because.

- (a) they depend on straight line propagation which applies to microwave only
- (b) losses would be too heavy at low frequency
- (c) there are no generators powerful enough to excite them at lower frequencies
- (d) they would be too bulky at lower frequencies.

Q38. The wavelength of a wave in a waveguide

- (a) is greater than in free space
- (b) depends on the wavelength dimensions and the free space wavelength
- (c) is inversely proportional to the phase velocity
- (d) is directly proportional to the group velocity

Q39. Which type of transmission line will have the least characteristic impedance?

- (a) open wire line
- (b) twin lead line
- (c) coaxial cable
- (d) all have same impedance

Q40. The measure of mismatch between the load and the transmission line is known as:

- (a) directivity
- (b) (1-Gain)
- (c) standing wave ratio
- (d) reflection coefficient

Q41. CRO helps in measuring the following values of an ac voltage

- (a) rms value only
- (b) peak value only
- (c) average value only
- (d) all the above three

Q42. Hysteresis in a measuring instrument implies

- (a) repeatability of the instrument
- (b) reliability of the instrument
- (c) change in the same reading when input is first increased and the decreased
- (d) inaccuracy due to change in temperature

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- Q43. In moving coil instruments scale used is
- (a) nonlinear scale (b) linear scale
(c) square scale (d) logarithmic scale
- Q44. The coil of the moving coil meter is wound on
- (a) Aluminium frame (b) Iron frame
(c) Insulating frame (d) A semiconductor material
- Q45. A 1mA meter has coil resistance of 300 ohms. It's sensitivity is given by
- (a) 1 mA, 300 mV (b) 1 mA, 3000 mV
(c) 1 mA, 300 ohms (d) 1 mA, 3000 ohms
- Q46. Power of 6-phase circuit can be measured with minimum of
- (a) two wattmeters (b) three wattmeters
(c) four wattmeters (d) five wattmeters
- Q47. In bridge methods of measurement, the common errors developed are
- (a) leakage and eddy current errors (b) residual errors
(c) frequency and waveform errors (d) all of these
- Q48. Wien bridge is used for the measurement of
- (a) resistance (b) capacitance (c) frequency (d) inductance
- Q49. De potentiometer accuracy is more than the ac potentiometer accuracy because
- (a) its power consumption is low
(b) standard cells are available as reference voltage source
(c) de potentiometers are more sensitive
(d) the statement is not true
- Q50. Piezo electric quartz crystal can be used to measure
- (a) temperature
(b) velocity
(c) acceleration
(d) flow

Contd....8/-

....8....

State whether the following statements are true or false:

- Q51. In a closed loop system of feedback, signal is usually positive (T/F)
- Q52. Nyquist criteria gives direct value of corner frequency (T/F)
- Q53. The polar plot for negative frequencies is the image reflection of positive frequencies plot (T/F)
- Q54. A high damping ratio will give a high over shoot (T/F)
- Q55. A potentiometer cannot be used as a control element (T/F)
- Q56. The capacitance is not used to fabricate a lag network (T/F)
- Q57. Laplace transform of an impulse function is 1 (T/F)
- Q58. The velocity error constant for a type 1 system is infinite (T/F)
- Q59. The acceleration error constant for a type 0 system is $k_a=0$ (T/F)
- Q60. The system $G=1/s$, $H=1$ is a type 0 system (T/F)
- Q61. Intel 8080A and 8085A differ in
 (a) number of address lines (b) number of data signal
 (c) instruction set (d) number of interrupt
- Q62. In a 8-bit microcomputer having 8K bytes of RAM memory, the length of SP will be
 (a) 5 (b) 8 (c) 11 (d) 13
- Q63. An instruction cycle is made up of
 (a) one or more execute cycles
 (b) one or more fetch cycles
 (c) one opcode and one execute cycle
 (d) none of these
- Q64. In a 8-bit microprocessor, the fetch cycle required to fetch a 8 byte instruction will be
 Contd....9/-

.....9.....

- (a) 1 (b) 2 (c) 3 (d) depends on computer design

Q65. The address bus of Intel 8085 is 16 bit wide and hence the memory which can be accessed by this address bus is

- (a) 112 (b) 4KB (c) 16KB (d) 64KB

Q66. Microprocessor can be

- (a) non-programmable (b) macro-programmable
(c) micro-programmable (d) all of these

Q67. The register which holds address of the location to or from which data are to be transferred is known as

- (a) index register (b) instruction register
(c) memory address register (d) memory data register

Q68. A 32-bit microprocessor has word length equal to

- (a) 1 byte (b) 2 bytes (c) 4 bytes (d) 8 bytes

Q69. 8085 microprocessor is a

- (a) zero address microprocessor
(b) one address microprocessor
(c) two address microprocessor
(d) none of these

Q70. A microprocessor is also referred to as

- (a) the chip that does some calculations for the computer
(b) the computer on a chip
(c) the chip that is responsible for data transfer
(d) none of these

State following statements as True or False (T/F):

Q71. MS-DOS is an application software

(T/F)

Q72. One byte is equal to six bit

(T/F)

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.....10.....

- Q73. Storage capacity of 5 1/4 " DSDD floppy disk is 1.2MB (T/F)
- Q74. ROM is volatile (T/F)
- Q75. Monitor displays information in 20 to 25 lines and 80 columns (T/F)
- Q76. CRC is based on binary addition (T/F)
- Q77. X.25 is a packet switched Local Area Network (T/F)
- Q78. Sliding window mechanism is used for flow control (T/F)
- Q79. The bridge operate at the data link layer of OSI model (T/F)
- Q80. X.25 interface requires the DTE to be a packet mode device (T/F)

Match the following with most appropriate words from Column 'A' to Column 'B':

<u>Column 'A'</u>	<u>Column 'B'</u>
Q81. Mouse	(a) Auxiliary memory
Q82. Floppy disk	(b) Control unit
Q83. Printer	(c) Input device
Q84. Operating system	(d) Output device
Q85. CPU	(e) Application software
	(f) System software
	(g) Main memory
Q86. The input unit of a computer	
(a) feeds the data in CPU	
(b) retrieves the data from CPU	
(c) directs all other units	
(d) all of these	

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.....11.....

Q87. A software program stored in a ROM that cannot be changed easily is known as

- (a) hardware
- (b) linker
- (c) editor
- (d) firmware

Q88. C programming language provides operations which deal directly with Objects such as

- (a) strings and sets
- (b) lists and arrays
- (c) characters, integers and floating point numbers
- (d) all of these

Q89. In C language bitwise operators can be applied to which of the following operands

- (a) char
- (b) short, long
- (c) int
- (d) all of the above

Q90. Compiler and interpreters are examples of

- (a) system software
- (b) application software
- (c) both system and application software
- (d) none of these.
