BSNL JTO (Telecom)

Question bank

For Direct Recruitment of Junior Telecom Officers, an objective type Examination of 3 hours duration consisting of following sectional papers will be conducted:

SCHEME
A. Engineering Stream Section - I
B. Engineering Stream Section - II
C. General Ability Test Section - III

- The standard of paper in Engineering subjects will be that of Engineering Degree Examination of an Indian University.
- In the general ability test, special attention will be paid to assess the candidate's capacity for general awareness. The standard of paper in general ability test will be such as may be expected of an Engineering Graduate.

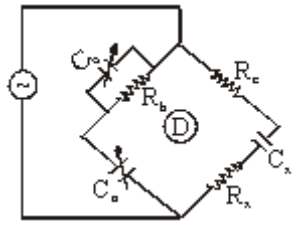
The syllabus for engineering stream papers will be as given below.

SECTION - I
1. Materials and components
2. Physical Electronics, Electron Devices and ICs
3. Network theory
4. Electromagnetic Theory
5. Electronic Measurements and instrumentation
6. Power Electronics

SECTION-II
1. Analog Electronic Circuits
2. Digital Electronic Circuits
3. Control Systems
4. Communication systems
5. Microwave Engineering
6. Computer Engineering
7. Microprocessors

SECTION-III
General ability test
The candidate's comprehension and understanding of General English shall be tested through simple exercises. Questions on knowledge of current events and of such matter of everyday observation and experience in their scientific aspects as may be expected of an educated person. Questions will also be included on events and developments in Telecommunications, History of India and Geography. These will be of a nature, which can be answered without special study by an educated person.

1. *In the ac bridge shown in the given figure, the value of R_x and C_x at balance will be –*



a. $R_x = \frac{C_b}{C_a}, C_x = \frac{R_b}{R_c} C_a$

b. $R_x = \frac{C_a}{C_b} R_c, C_x = \frac{R_c}{R_b} C_a$

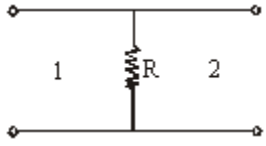
c. $R_x = \frac{C_a}{C_b} R_c, C_x = \frac{R_b}{R_c} C_a$

d. $R_x = \frac{C_b}{C_a} R_c, C_x = \frac{R_c}{R_b} C_a$

2. *Which one of the following conditions for Z parameters would hold for a two port network containing linear bilateral passive circuit elements to be reciprocal –*

a) $Z_{11} = Z_{22}$ b) $Z_{12}Z_{21} = Z_{11}Z_{22}$ c) $Z_{11}Z_{12} = Z_{22}Z_{21}$ d) $Z_{12} = Z_{21}$

3. *The two port network of the fig. shown has open circuit impedance parameters given by matrix –*



a) $\begin{bmatrix} R & R \\ R & R \end{bmatrix}$ b) $\begin{bmatrix} R & O \\ O & R \end{bmatrix}$ c) $\begin{bmatrix} \infty & R \\ R & \infty \end{bmatrix}$ d) None

4. *While calculating R_{th}, constant current sources in the circuit are –*

a) Replaced by opens b) replaced by 'shorts'
c) converted into equivalent voltage sources d) None

5. *Maxwell's loop current method of solving electrical networks –*

a) uses branch currents b) utilizes Kirchhoff's voltage law
c) is confined to single-loop circuits d) utilizes Kirchhoff's current law

6. *The output signals amplitudes for 1's and 0's in an ADM transmission systems are –*

a) Fixed and the repetition rate is also fixed
b) Fixed but the repetition rate is variable
c) Variable and the repetition rate is also variable
d) Variable but the repetition rate is fixed

7. *Microwave link repeaters are typically 50km apart –*

a) Because of atmospheric attenuation
b) Because of Output tube power limitations
c) Because of the earth's curvature
d) To ensure that the applied ac voltage is not excessive

8. *The amplifier inserted at intervals to amplify the signal and compensate for transmission loss on the cable are called-*

a) line amplifier

b) equalizing amplifiers
c) compradors
d) repeaters.

9. Diversity reception in used to-

a) increase receiver sensitivity
b) improve receiver selectivity
c) overcome degrading effect of fading
d) overcome degrading effect of receiver detuning

10. Mark out transferred electron device in the following-

a) BARITT diode
b) IMPATT diode
c) Gunn diode
d) Step recovery diode

11. In the output of a normal monochrome receiver video detector voltages, which are not found, are

a) sync
b) video
c) sweep
d) sound

12. The HV anode supply for the picture tube of TV receiver is generated in the-

a. mains transformer b. vertical output stage
c. horizontal output stage d. horizontal deflection oscillator

13. The frequency range for satellite broad casting is –

a) 30 MHz – 300MHz
b) 30 MHz – 3 GHz
c) 3 GHz – 30 GHz
d) 30 GHz – 300 GHz

14. Iris is used to –

a) Overcome power loss
b) Overcome bending effect
c) Overcome mismatch error
d) Overcome twist effect

15. In schottky barrier diode current flows because of –

a) Majority carriers
b) Minority carriers
c) Majority and minority carriers
d) None

16. *Which antennas are used in microwave communication –*

a) long wave antennas
b) Rhombic antennas
c) Paraboloidal antennas
d) All of above

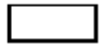
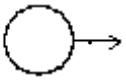
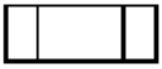
17. *No of T-state required for memory read or write operation-*

a) 2 b) 3 c) 4 d) 6

18. *In data transfer operation which flag get affected-*

a) 3140 flog. b) carry flog c)sign flog. d) one

19. *In flowchart which figure represents process like subroutine-*

a. 
b. 
c. 
d. 

20. *The storage and retrieval of data on stacks should follow sequence-*

a) Last in first out b)first in first out c)random in random out d)none

21. *While executing program microprocessor checks INTR line clearing-*

a)each instruction b) after interval of two instruction
c)after a subroutine d) at the end of program.

22. *In which error check technique of data communication 2's complement of all bytes of data is transmitted with data-*

a) Even parity
b) odd parity
c) check scans
d) cyclic redundancy

23. *Program execution hierarchy decides which operator-*

a) is most important
b) is used first
c) is fastest
d) operators on largest number

24. $(375)_{10} = (----)_8$

a) 550
b) 557
c) 567
d) 577

25. *To obtain 2048 × 8 memory using 128 × 8 memory chip how many IC required-*

a) 2

b) 4
c) 8
d) 16

26. A Decimal no. 17 can be converted in binary, the binary no. will be.-

a) 10001
b) 01110
c) 00111
d) 11100

27. Is the Universal logic gate-

a) AND
b) OR
c) NAND
d) X-OR

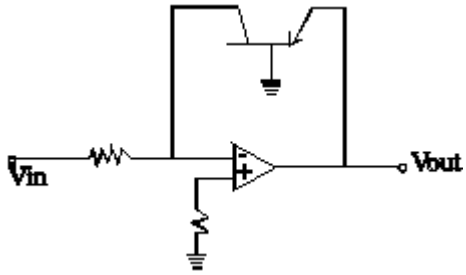
28. A monostable state in multivibrator means-

a) which returns itself to its single stable state
b) the state used only once in circuit
c) the state of circuit cannot get changed
d) the state of circuit always changing

29. For designing binary counter which flip flop is preferred -

a) T FF b) SR FF c) D FF d) JKFF

30. The op-map circuit shown in the given figure can be used for –



a) Addition b) subtraction
c) Both addition and subtraction d) multiplication

31. One of the following devices which is required in addition in order to measure pressure using LVDT is-

a) strain gauge
b) pitot tube
c) Bourden tube
d) Thermo couple

32. It is required to measure temperature in the range of 1300^0 C to 1500^0 c) The most suitable thermocouple to be used as a transducer would be –

a) chromel - constantan
b) Iron - constantan
c) chromel - alumel
d) platinum- rhodium

33. In the RF amplifier stage cascade (CE-CB) amplifier is used because it gives-

a) Large voltage gain
b) Low output impedance
c) Large isolation between the input and the output
d) None of the above

34. An FM radio receiver is tuned to a 90.6 MHz broadcast station. It will receive an image frequency of -

a) 110 MHz
b) 112 MHz
c) 114 MHz
d) 120 MHz

35. A transistor is operated as a non-saturated switch to eliminate –

a)storage time
b) turn – off time
c) turn – on time
d) delay time

36. Major advantage of TWT over a klystron lies in its –

a) higher bandwidth
b) higher output
c) higher frequency
d) higher gain

37. A lag compensator is basically a –

a) High pass filter
b) band pass filter
c) low pass filter
d) band elimination filter

38. The Temperature coefficient of a thermister is -------- and that of a sensistor is----

a) +ve, also +ve
b) +ve, -ve
c) -ve, +ve
d) -ve, also -ve

39. Pick the odd man out:

a) Tunnel diode
b) IMPATT diode
c) Gunn diode
d) Zener diode.

40. which dielectric has least thermal conductivity:

a) Alumina
b) Porcelain
c) Air
d) Paper.

SOLUTIONS

1. a. $R_x = \frac{C_b}{C_a}, C_x = \frac{R_b}{R_c} C_a$ The bridge is balanced when (Rx+jCx)(Rb||jCb)=Rc||jCa.

2. d) $Z_{12} = Z_{21}$

3. a) $V_{1=} I_1 R + I_2 R$; $V_{2=} I_1 R + I_2 R$ So Z matrix is $\begin{bmatrix} R & R \\ R & R \end{bmatrix}$

4. a) All sources are replaced by its equivalent resistances. So Current sources are Replaced by opens.

5. b) Utilizes Kirchhoff's voltage law.

6. d) Variable but the repetition rate is fixed

7. c) Because of the earth's curvature

8. d) repeaters

9. c) overcome degrading effect of fading

10. c) Gunn diode

11. c) sweep

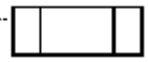
12. c) horizontal output stage

13. c) 3 GHz – 30 GHz

14. c) Over come mismatch error

15. b) Minority carriers

16. c) Paraboloidal antennas

17. b) 3
18. d) none
19. d. 
20. a) last in first out
21. a) each instruction
22. c) check scans
23. b) is used first
24. c) 567
25. d) 16
26. a) 10001
27. c) NAND
28. a) which returns itself to its single stable state
29. c) D FF
30. d) Multiplication. The circuit shown in fig is a Log amplifier.
31. c) Bourden tube
32. d) platinum- rhodium
33. c) Large isolation between the input and the output
34. b) 112 MHz
35. b) turn – off time
36. d) higher gain
37. c) low pass filter
38. c)
39. d) Zener diode. All others are –ve resistance devices.
40. c) Air.

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