

BSNL Whole Testpaper

1. Reactive current through the inductive load produces-
2. a) Magnetic field
3. b) Electric field
4. c) Super magnetic field
5. d) None
6. When a piece of copper and another of germanium are cooled from room temperature to 80° K then the resistance of -
 - a) each of them increases
 - b) each of them decreases
 - c) copper increases and germanium decreases
 - d) copper decreases and germanium increases
7. A capacitance transducer has two plates of area 5 cm^2 each separated by an air gap of 2mm. Displacement sensitivity in pF /cm due to gap change would be -
 - a) 11.1
 - b) 44.2
 - c) 52.3
 - d) 66.3
8. The critical angle in degrees, for an electromagnetic wave passing from Quartz ($m = m_0$, $\hat{\epsilon}=4\hat{\epsilon}_0$) into air is-
 - a) 15
 - b) 30
 - c) 45
 - d) 90
9. When an RC driving point impedance function has zeros at $s = -2$ and $s = -5$ then the admissible poles for the function would be –
 - a) $s = 0$; $s = -6$
 - b) $s = -1$; $s = -3$
 - c) $s = 0$; $s = -1$
 - d) $s = -3$; $s = -4$
10. A capacitor used for power factor correction in single- phase circuit decreases –
 - a) the power factor
 - b) the line current
 - c) Both the line current and the power factor

- d) the line current and increases power factor
11. The unit of inductance is –
- a) ohm
 - b) inductive reactance
 - c) inducta
 - d) Henry
12. Which type of by-pass capacitor works best at high frequencies –
- a) electrolytic
 - b) mica
 - c) ceramic
 - d) plexiglass
13. The usual value of the surge impedance of a telephone line is –
- a) 600 W
 - b) 500 W
 - c) 75 W
 - d) none
14. Telemetry is a method of –
- a) counting pulses, sent over long distances
 - b) transmitting pictures from one place to another
 - c) transmitting information concerning a process over a distance
 - d) None
15. In an unbiased P-N junction thickness of depletion layer is of the order of –
- a) 0.005 mm
 - b) 0.5 mm
 - c) 5 mm
 - d) 10^{-10} m
16. One of the semiconductor device, which behaves like two SCRs is–
- a) UJT
 - b) triac
 - c) JFET
 - d) MOSFET
17. The following, which is not an advantage of semiconductor strain gauges as compared to conventional strain gauges, is –
- a) excellent hysteresis characteristics

- b) least sensitive to temperature changes
 - c) high fatigue life
 - d) smaller size
18. The fundamental ripple frequency of a half wave 3F rectifier with a 3F supply of frequency 50 Hz is –
- a) 150 Hz
 - b) 50 Hz
 - c) 100 Hz
 - d) 250 Hz.
19. For an FR biased PNP transistor –
- a) base is negative with respect to emitter
 - b) collector is positive with respect to emitter
 - c) collector is a little more positive than base
 - d) base is a little less positive with respect to emitter than collector
20. With normal operation of a JFET one can get I_{DSS} –
- a) the maximum drain current
 - b) the minimum drain current
 - c) normal drain current
 - d) none
21. An SCR is a semiconductor device made up of –
- a) Four N type layers
 - b) Two P types and three N type layers
 - c) Two P type and two N type layers
 - d) Three P type and one N type layers
22. For a UJT, if R_1 = resistance from emitter to base 1, R_2 = resistance from emitter to the base 2 and $R_{BB} = R_1 + R_2$ then the intrinsic stand off ratio (h) is –
- a) $\frac{R_2}{R_1 + R_2}$
 - b)
 - c)
 - d)

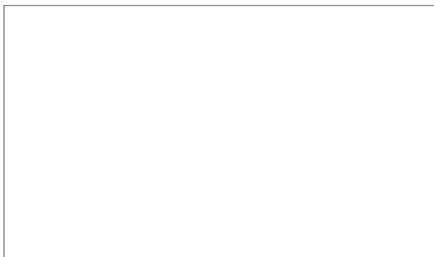
23. As the drain voltage is increased for a junction FET in the pinch off region then the drain current –

- a) becomes zero
- b) abruptly decreases
- c) abruptly increases
- d) remains constant

24. When the energy gap of a semiconductor is 1.1eV then it would be –

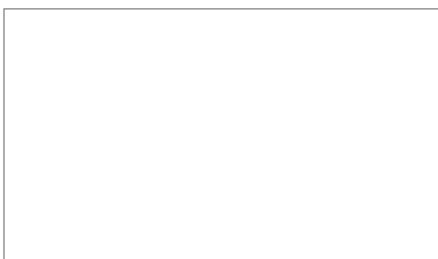
- a) opaque to the visible light
- b) transparent to the visible light
- c) transparent to the infrared radiation
- d) opaque to the infrared radiation

25. The equivalent capacitance across ab will be –



d) 0

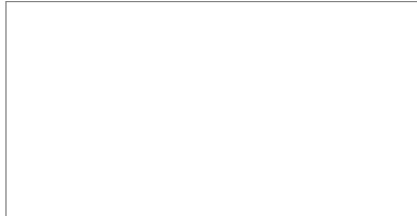
26. In the following fig. the power dissipated is maximum when the value of R_x is –



- a) 33.4 K
- b) 17.6 K
- c) 10 K
- d) 5 K

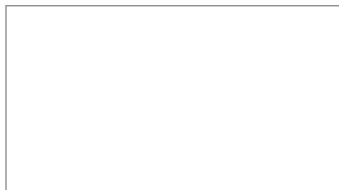
27. The transfer function of a low pass RC network is –

28. The total capacitance across points ,a, and ,b, in the given figure is –



- a) 1.66 mF
- b) 2.66 mF
- c) 3.5 mF
- d) 4.5 mF

29. The load resistance needed to extract maximum power from the following circuit is –

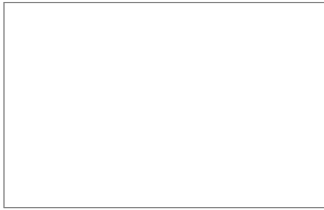


- a) 2W
- b) 9W
- c) 6W
- d) 18W

30. Which one of the following conditions for z parameters would hold for a two port network containing linear bilateral passive circuit elements –

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

31. In the network shown, the switch is opened at $t = 0$. Prior to that, the network was in the steady state, $V_s(t)$ at $t = 0$ is –



- a) 0
- b) 5V
- c) 10V
- d) 15V

32. Which of the following statements are correct –

- 1. Tellegen's theorem is applicable to any lumped network
 - 2. The reciprocity theorem is applicable to linear bilateral networks.
 - 3. Thevenin's theorem is applicable to two terminal linear active networks.
 - 4. Norton's theorem is applicable to two terminal linear active networks.
- a) 1, 2 and 3
 - b) 1, 2, 3 and 4
 - c) 1, 2 and 4
 - d) 3 and 4

33. Which one of the following transfer functions represents the critically damped system ?



34. When the respective coil impedance of the circuit shown in the fig. is $Z_1 = (5 + j8)\Omega$ and $Z_2 = (3 + j8)\Omega$ then the input impedance of the circuit will be –



- a) $(8 + 16j)\Omega$
- b) $(2 + j0)\Omega$

- c) $(15 + 64j)W$
d) $(8 + 0j)W$
35. One of the following statement which is not correct -
- a) In case of an antenna, the radiation resistance and loss resistance are not two different quantities.
 - b) The loss resistance includes loss by eddy currents, improper earth connections, insulation leakages etc) but not I^2R losses
 - c) Radiation resistance varies directly as square root of the frequency
 - d) None of the above
36. Ultraviolet radiation emitted when electron jumps from an outer stationary orbit to -.
- a) first stationary orbit
 - b) second stationary orbit
 - c) third stationary orbit
 - d) fourth stationary orbit
37. When the signal is propagated in a waveguide which has a full wave of electric intensity change between the two farther walls and no component of the electric field in the direction of propagation then the mode is -
- a) TE_{11}
 - b) TE_{10}
 - c) TM_{22}
 - d) TE_{20}
38. Consider the following statements pertaining to parabolic antenna -
1. It is commonly used above 1GHz
 2. It get's circularly polarized
 3. It's radiation pattern is highly directional
 4. It's radiation pattern is cardioid
- of these statements-
- a) 1,2 and 4 are correct
 - b) 1 and 3 are correct
 - c) 1,2 and 3 are correct
 - d) 2 and 4 are correct
39. When a vertical dipole antenna is used in conjunction with a loop antenna for direction finding, then the field pattern obtained will be-

40. When one end of a loss less transmission line of length $3/8 l$ and characteristic impedance R_0 is short circuited and the other end is terminated in R_0 then the impedance at $l/8$ away from the end terminated in R_0 is-

- a) Zero
- b) R_0
- c) $R_0/2$
- d) Infinite

41. For transmission of wave from a dielectric permittivity $\hat{\epsilon}_1$ into dielectric medium of lower permittivity $\hat{\epsilon}_2$ ($\hat{\epsilon}_1 > \hat{\epsilon}_2$) the critical angle of incidence Q_c (relative to the interface) is given by -

42. A transmission line has primary constants R, L, G and C and secondary constants Z_0 and γ ($= a + jb$) if the line is loss less then .

43. The intrinsic impedance of a free space is-

44. One of the following which is a low gain but omni directional antenna is-

- a) disccone
- b) log-periodic
- c) loop
- d) helical

45. Electronic voltmeters have –

- a) high input impedance
- b) low input impedance
- c) zero input impedance
- d) none

46. Which of the following statement about impulse voltage is true ?

- a) An impulse voltage is an unidirectional voltage.
- b) In chopped impulse voltage, flashover does not occur.
- c) Time taken to rise is exactly equal to the time taken to fall.
- d) RMS value of impulse voltage is always less than 50% of average value.

47. The precision of an instrument indicates its ability to reproduce a certain reading with a given –

- a) drift
- b) resolution
- c) shift.
- d) consistency

48. In heterodyne digital conductor, the input signal is heterodyned to a –

- a) higher frequency
- b) lower frequency
- c) both a and b)
- d) none

49. In a digital measuring device, if the input electrical signal is in the frequency range dc to f_{\max} Hz, then it must be sampled at a rate of –
- a) f_{\max} times/sec
 - b) f_{\max} times/ses
 - c) every $2f_{\max}$ /sec
 - d) $2 f_{\max}$ times/sec .
50. Moving Iron intruments measures the rms value of –
- a) a direct quantity
 - b) an alternating quantity
 - c) a virtual quantity.
 - d) none.
51. One of the following intruments which is used almost exclusively to measure radio frequency current is-
- a) Moving coil meter
 - b) Rectifier-type moving coil meter
 - c) Iron-vane meter
 - d) Thermocouple meter.
52. A good ohmic contact on a p- type semiconductor chip is formed by introducing –
- a) gold as an impurity below the contact
 - b) a high concentration of donors below the contract
 - c) a high concentration of acceptors below the contact
 - d) a thin insulator layer between the metal and semiconductor.
53. The use of thermocouple meters for ac measurement leads to a meterscale which is –
- a) linear
 - b) square law
 - c) logarithmic
 - d) exponential
54. If low pressure of the order of 10^{-6} mm of Hg is to be measure then the instrument of choice would be-
- a) compound pressure gauge
 - b) thermocouple vacuum gauge
 - c) pirani gauge
 - d) ionization type vacuum gauge

55.



In the given circuit if the power dissipated in the 6W resistor is zero then V is –

a)

b)

c)

d)