

PG Diploma in Broadcast Technology
Sample paper for entrance examination 2016

Time: Three Hours

Total Marks: 200

GENERAL INSTRUCTIONS

- . ALL QUESTIONS ARE COMPULSORY.
- . The Question Paper comprises of Part- I (Objective/OMR) and Part- II (Descriptive/Subjective). Part -II comprises of Sections, A, B, and C.

Part- I (Objective/OMR)

(Marks: 20 x 1 =20 marks)

Instructions:

There is one correct answer to each question. Write the correct answer A or B or C or D.

- 1) Which of the following is not a basic element within the microprocessor?
 - A) Microcontroller
 - B) Arithmetic logic unit (ALU)
 - C) Register array
 - D) Control unit

- 2) Ku Frequency band is used for
 - A) FM broadcasting
 - B) Terrestrial Television broadcasting
 - C) Direct to Home satellite broadcasting
 - D) None of the above

- 3) For a "D-Flip Flop", whenever it is triggered
 - A) The output is inverted input
 - B) The output follows the input
 - C) Bothe the above
 - D) None of the above

- 4) The FM and TV terrestrial broadcasts are examples of
- A) Ground wave propagation
 - B) Sky Wave propagation
 - C) Line of sight communication
 - D) Satellite communication
- 5) Optical communication is carried out in
- A) Visible spectrum range
 - B) Microwave frequency range
 - C) Ultra High Frequency range
 - D) None of the above
- 6) The electric field signal strength is measured in
- A) Coulomb/Sec
 - B) Volt-meter
 - C) Volt-Ampere
 - D) Volt/meter
- 7) Which of the following media is used for the transmission of electromagnetic waves from 3 GHz to 30 GHz?
- A) Optical fiber cables
 - B) Co-axial cables
 - C) Waveguides
 - D) Open wire line
- 8) Three Capacitors of $3 \mu\text{F}$ are connected in parallel, the total capacitance across the terminals is
- A) $9 \mu\text{F}$
 - B) $1 \mu\text{F}$
 - C) $3 \mu\text{F}$
 - D) None of the above
- 9) The current in a pure inductive circuit
- A) Leads voltage by 90°
 - B) Lags voltage by 90°
 - C) is in phase with current
 - D) None of the above
- 10) An electromagnetic wave is said to be vertically polarized if
- A) The Magnetic field is perpendicular to the earth
 - B) The Electric field is perpendicular to the earth
 - C) If it is moving perpendicular to the earth
 - D) None of the above
- 11) The most popular method for measurement of medium resistance is
- A) Ammeter – voltmeter method
 - B) Potentiometer method
 - C) Wheatstone bridge method
 - D) Maxwell's bridge method
- 12) In a transformer e.m.f. equation the value of flux is
- A) Average value
 - B) RMS value
 - C) Maximum value

- D) None of the above
- 13) In Star connected power system the phase current and line current are related as
 A) Phase Current $\neq \sqrt{3}$ Line current
 B) Phase current = Line Current
 C) Phase Current = Line current $\sqrt{3}$
 D) None of the above
- 14) In a PNP transistor if biased to operate in active region, the base current is
 A) due to electrons only
 B) due to holes only
 C) Mainly due to holes
 D) Mainly due to electrons
- 15) Which of the following has highest mobility?
 A) Electron
 B) Neutron
 C) Positive ion
 D) Negative ion
- 16) Which of the following is a universal gate?
 A) AND
 B) OR
 C) NAND
 D) EX-OR
- 17) How is a *J-K* flip-flop made to toggle?
 A) $J = 0, K = 0$
 a. B) $J = 0, K = 1$
 b. C) $J = 1, K = 0$
 c. D) $J = 1, K = 1$
- 18) The two inputs to an X-OR gate are "A=1" and "B=1". These are changed to "A=0" and "B=0". The output will
 A) Change from "1" to "0"
 B) Change from "0" to "1"
 C) Will remain "1"
 D) Will remain "0"
- 19) In a certain loaded transformer, the secondary voltage is one-fourth of the primary voltage. The secondary current is
 A) one-fourth the primary current
 B) four times the primary current
 C) equal to the primary current
 D) two times the primary current
- 20) ASCII stands for
 A) American standard code for information interchange
 B) All purpose scientific code for information interchange
 C) American security code for information interchange
 D) American Scientific code for information interchange

Part- II

Section – A

Fill in the blanks –

(Marks: 50 x 1 =50 marks)

- 1) The frequency range 174MHz to 230 MHz used for terrestrial TV Broadcast belongs to
- 2) Absolute zero temperature is
- 3) Band width of Audio signal is approximately
- 4) In the series RLC circuit, the currents passing in the circuit at resonance will be.....
- 5) The number of free electrons in intrinsic semiconductor decreases when the temperature
- 6) The current in a N type semiconductor current is mostly because of
- 7) An ideal voltage source has.....
- 8) The P type semiconductor is an example of.....
- 9) A Zener diode is operated in the following mode as a voltage stabilizer
- 10) If an circuit diagram representation of a transistor, the arrow is shown from base terminal to emitter terminal, then the transistor is a
- 11) If the depletion layer in PN junction decreases the its capacitance.....
- 12) An auto transformer has.....
- 13) Amplitude modulation of a carrier wave by a single frequency result in.....
- 14) In 16 QAM each symbol carries how many number of data hits.....

- 15) Ku frequency band is used for DTH (Direct to Home) service as frequency range of
- 16) An audio song is digitalized using 44.1 KHz sampling frequency and with 10 bit quantization. The resulting data rate is.....
- 17) The FM and TV terrestrial broadcasts use following mode of propagation.....
- 18) The impedance of a half wave dipole antenna is.....
- 19) A Computer is a device for automatically carrying out a/an.....
- 20) If in a transformer the number of primary turns is less than the number of secondary turns then the transformer is a
- 21) The internal resistance of an Ammeter and voltmeter are respectively
- 22) The electric field signal strength is measured in.....
- 23) A transformer steps up the voltage by a factor 100. The ratio of current in the primary to that in the secondary is.....
- 24) Tesla is a unit of
- 25) A coil of resistance 8 ohms and inductive reactance of 6 ohms is connected across 100 V, 50 Hz supply. The power factor of the coil will be
- 26) In a P-N junction having depletion layer of thickness 10^{-6} m the potential across it is 0.1 V. The electric field is.....
- 27) Thermal noise power is proportional to.....
- 28) The input impedance of an op amplifier is of the order of.....
- 29) The voltage gain of an amplifier is 100. A negative feedback of 4% will reduce the gain to.....
- 30) The name Wall Street is associated with.....
- 31) Three amplifiers each with a voltage gain of 10 are cascaded.....
- 32) In the symbol of transistor, an arrow head points in the direction of.....
- 33) The minimum number of geostationary satellites needed for uninterrupted global coverage is

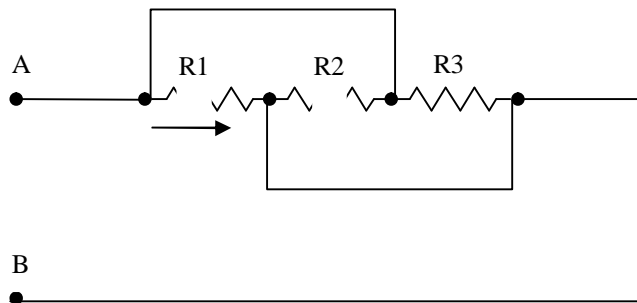
- 34) The power factor of an ac circuit lies between.....
- 35) Binary equivalent of decimal number 16 is
- 36) The output power of 2x3 kW FM transmitter reduces to 3 kW due to failure of one transmitter.
This reduction can be expressed in dB.....
- 37) In an amplitude modulated wave for the audio frequency of 500 Hz, the appropriate carrier
Frequency will be.....
- 38) D-layer disappears at.....
- 39) The standard IF value for AM receivers & FM receivers are respectively.....
- 40) Electric energy consumption is measured in.....
- 41) An op-amp has impedance
- 42) Power factor of a pure inductive circuit is.....
- 43) Electromagnetic waves travel at the speed of
- 44) The video portion of a television ismodulated.
- 45) The frequency of the DC signal is.....
- 46) If the length of a copper wire is doubled, its resistance will.....
- 47).....is a universal gate?
- 48) Silicon atom has.....valance electrons.
- 49) An auto transformer has.....winding
- 50) "The algebraic sum of currents meeting at any point of the network at any instant is zero"
is known as law

Section – B

(20 Short answer type questions of 5marks each)

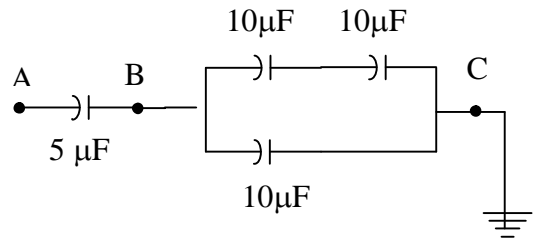
(Marks: 20 x 5 =100 marks)

- 1) What is a transducer? Discuss one important transducer that may be found in a radio studio.
- 2) A four-pole alternator is revolving at 1500 rpm speed. Find the frequency of the alternator.
- 3) Find out the decimal number equal to the binary number $(1111)_2$.
- 4) Two NOR gates have inputs as (1, 1) and (0, 0) respectively. Their outputs are fed to an XOR gate. Find the output of XOR gate.
- 5) Draw the circuit of Operational amplifier (OP Amp) as a integrator.
- 6) Find the number of bits required for a Digital to Analog (D/A) converter, if resolution required is 1 mV and maximum input voltage is 1 Volt.
- 7) In the following circuit, if $R_1=40\ \Omega$ and $R_2 = R_3 = 80\ \Omega$ find $V_{AB}=80\text{ V}$. Find the current through R_1 .



- 8) State and explain Faraday's first law of Electromagnetic Induction.
- 9) Write difference between active and passive filters.
- 10) What is geo stationary satellite? How it is useful for broadcasting?
- 11) If $V_A=2000\text{ Volts}$, find the potential difference between point A and B, in the following circuit.

- 12) Explain how NAND gates can be used to realize the function of an OR gate.



- 13) Explain the role of Client and Server in a network system?
- 14) Write the proper names of the following electronic devices.



- 15) Draw diagram of a transistor as an amplifier in the common Emitter (CE) configuration.

OR

Explain the role of a Switch and Router in networking.

- 16) Discuss the principle of optical communication through optical fiber.

OR

Describe the differences between the functions of a MODEM and REPEATER in a communication link.

- 17) What do you understand by media Write examples of electronic media ?
- 18) Differentiate between conductor, insulator and semi conductor material and give example of each?
- 19) What is Kirchhoff's current law?
- 20) Write key differences between P type and N Type semiconductors

Section – C

Note : Answer any TWO descriptive type questions. Please limit each answer to about 200 words.

(Marks : 2 x 15 = 30)

- Q.1 Discuss why do you want to join this course and how it is going to be helpful for your career objective? What contributions in your opinion can you make as a broadcast professional?

- Q.2 Explain the difference between analog and digital signals. Discuss the advantages of digital signal in their processing, storage and transmission. Why digital media is preferred over analog media?

- Q.3 Explain the use of internet for communication. Discuss the different services provided over internet? What are the limitations of internet with regard to distribution of audio and video broadcast media services?

- Q.4 Explain why modulation of signals is required to be done . Compare Amplitude modulation and frequency modulation techniques.

- Q.5 Discuss the role of computer networking and Information Technology in broadcasting.