भाविनि
BHAVINI

भारतीय नाभिकीय विद्युत निगम लिमिटेड
BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED
(भारत सरकार का उद्यम / A Government of India Enterprise)
कल्पाक्कम/ Kalpakkam - 603 102
कॉचीपुरम जिला (तमिलनाडु)/ Kancheepuram Dt.(TN)

Sample Question for the Written Examination for the post of Scientific Assistant/B (HEALTH PHYSICS)

1	If you push for an hour against a stationary wall, you do no work (A) On the wall (B) at all (C) both of these (D) none of these
2	When an object is lifted 10 meters, it gains a certain amount of potential energy. If the same object is lifted 20 meters, its potential energy gain is (A) Less. (B) the same. (C) twice as much. (D) Four times as much
3	A 1000-kg car and a 2000-kg car are hoisted the same distance in a gas station. Raising the more massive car requires (A) less work. (B) as much work. (C) twice as much work. (D) four times as much work.
4	It takes 40 J to push a large box 4 m across a floor. Assuming the push is in the same direction as the move, what is the magnitude of the force on the box? (A) 4 N (B) 10 N (C) 40 N (D) 160 N
5	A heavy pile driver starting from rest falls on a pile with a force that depends on (A) the original height of the driver. (B) the original potential energy of the driver. (C) the distance the pile is moved. (D) all of these.
6	Using 1000 J of work, a toy elevator is raised from the ground floor to the second floor in 20 seconds. How much power does the elevator use? (A) 20 W (B) 50 W (C) 100 W (D) 1000 W
7	A ball is projected into the air with 100 J of kinetic energy which is transformed to gravitational potential energy at the top of its trajectory. When it returns to its original level after encountering air resistance, its kinetic energy is (A) less than 100 J. (B) more than 100 J. (C) 100 J. (D) not enough information given
8	A machine puts out 100 Watts of power for every 1000 Watts put into it. The efficiency Of the machine is (A) 10% (B) 50% (C) 90% (D) 110%

9	A diver who weighs 500 N steps off a diving board that is 10 m above the water. The diver hits the water with kinetic energy of (A) 10J. (B) 500 J. (C) 510 J. (D) 5000 J.
10	Consider a hydraulic press. When the input piston is depressed 20 cm, the output piston is observed to move 1 cm. On the same press, an input force of 1 N can raise no more than (A) 1 N. (B) 10 N. (C) 20 N. (D) 21 N.
11	A pulley system raises a 1000-N load with 100 N of input force. The efficiency of the System is (A) 10% (B) 90% (C) 1000% (D) not enough information given.
12	A person on the edge of a roof throws a ball downward. It strikes the ground with 100 J of kinetic energy. The person throws another identical ball upward with the same initial speed, and this too falls to the ground. Neglecting air resistance, the second ball hits the ground with a kinetic energy of (A) 100 J. (B) 200 J. (C) less than 100 J. (D) More than 200 J.
13	If a power plant is 30% efficient, and the transmission system that delivers power to consumers is 60% efficient, then the overall efficiency is (A) 90% (B) 60% (C) 30% (D) 18%
14	On a sunny day about 500 watts of solar power strikes each square meter of the earth's surface. If a solar automobile has 4 square meters of collectors area and 100% efficient collectors and motor, its power output is about (A) 0.27hp. (B) 2.7 hp. (C) 27 hp. (D) 270 hp.
15	A flower pot of mass m falls from rest to the ground below, a distance h. Which statement is correct? (A) The speed of the pot when it hits the ground is proportional to h. (B) The KE of the pot when it hits the ground is proportional to h. (C) The KE of the pot when it hits the ground does not depend on m. (D) The speed of the pot when it hits the ground depends on m.

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Sample Question for the Written Examination for the post of Scientific Assistant/B (ELECTRICAL)

1	When 9 ohm, 6 ohm, 10 ohm resister is connected in series. Find the power dissipated in 6 ohm resister. a) 20 watts b) 24 watts c) 48 watts d) 30 watts
2	Calculate the current and resistance of 50w, 100volt electric bulb a) i=1 amp, R=200 ohm b) i=0.5 amp, R=100 ohm c) i=0.5 amp, R=200 ohm d) i=1.5 amp, R=200 ohm
3	Thevenin's voltage is .56v, Rth is 7.22, load =20 ohm find the load current. a) 0.5 amps b) 0.7 amps c) 0.2 amps d) 1 amps
4	When current and voltage is in phase in the A.C circuit then what is the power factor a) 2 b) 0.8 c) 1 d) 0.7
5	In a series circuit R=5 ohm, L=20mh, frequency=1000 hz. Then find the value of capacitance at resonance condition. a) $1.27x10^{-6}$fared b) $0.27x10^{-6}$fared c) $2.26x10^{6}$fared d) $1.27x10^{6}$fared
6	60 kvA single phase transformer gave the following result **Oc test:** 3000v applied to primary and power taken 430 volt **Sc test:** primary input power is 525 watt Find efficiency at half load at 0.7 power factor a) 97.77% b) 95.55% c) 97.398% d) 96%
7	An impedance 6+j8 is connected across 220v, 50hz mains in parallel with another circuit having an impedance 8-6j ohms. Find total current taken from mains a) 30amps b) 25 amps c) 20amps d) 31.02 amps
8	In a pure capacitive circuit the power factor is 0 lead. What is the phase angle? a) Cos 60^0 b) sin 90^0 c) Cos 90^0 d) sin 60^0
9	What kvA rating is required for a transformer that must handle a maximum load current of 8 A with a secondary voltage of 2 Kv? a) 4 kvA b) 0.25kvA c) 16kvA d) 8kvA
10	A 47Ω resistor and a capacitor with a capacitance reactance of 120Ω are in series across a AC source. What is the circuit impedance Z ? a) 129Ω b) 12.9Ω c) 169Ω d) 73Ω

11	Resistors 2,3,4,5 ohms are connected in parallel. The total power absorbed by resistor is 200w. what's is the supply voltage? a) 12.5v b) 10.5v c) 15v d) 20v
12	A field excitation of 20A in a certain alternator results in an armature current of 400A in short circuit and a terminal voltage of 2000V on open circuit. The magnitude of the internal voltage drop within the machine at a load current of 200A is a) 1V b) 10V c) 100V d) 1000V
13	The DC motor, which can provide zero speed regulation at full load without any controller is a) Series b) Shunt c) Cumulative Compound d) Differential Compound
14	The rms value of load phase voltage is a) 106.1V b) 141.4V c) 212.2V d) 282.8V
15	A 120Ω resistor must carry a maximum current of 25Ma.its rating should be atleast a) 4.8 watts b) 150Mw c) 15Mw d) 480mW

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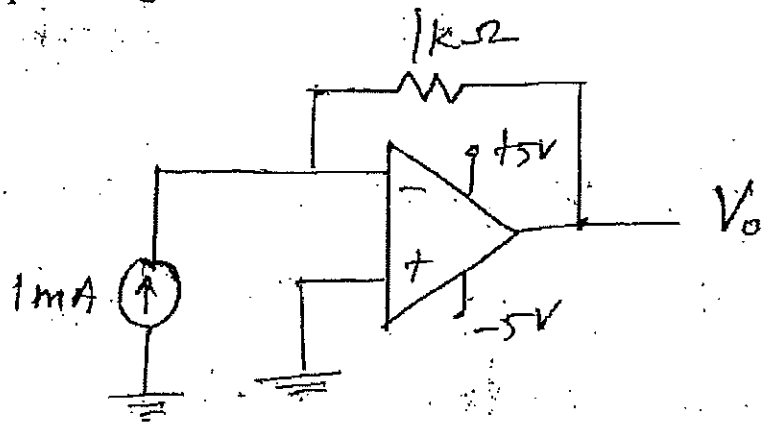
Sample Question for the Written Examination for the post of
Scientific Assistant/B (INSTRUMENTATION)

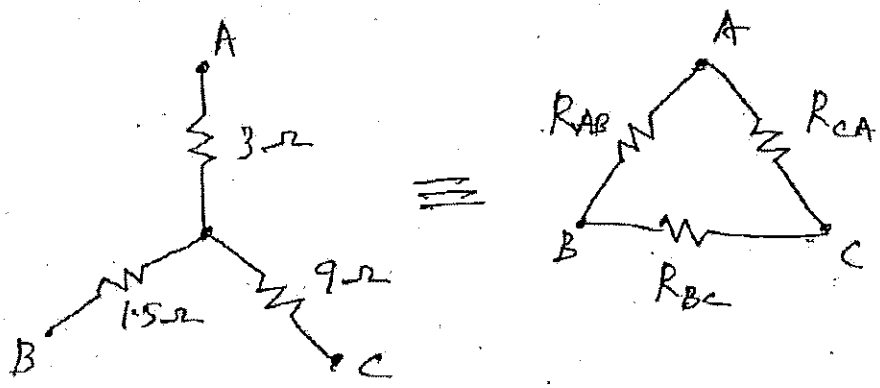
1. A 1 mA ammeter has a resistance of 100Ω. It is to be converted to a 1A ammeter. The value of shunt resistance is
   a. 0.001Ω
   b. 0.1001Ω
   c. 100000Ω
   d. 100Ω

2. The circuit shown in the figure uses an ideal op-amp working with +5V and -5V power supplies. The output voltage V_0 is



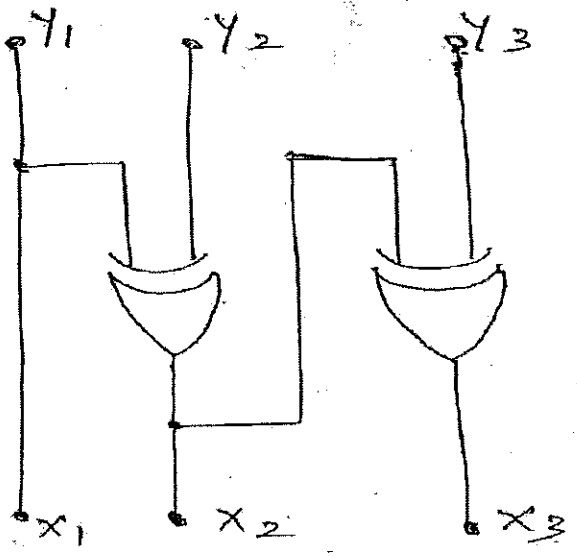
   a. +5V
   b. -5V
   c. +1V
   d. -1V

3. For the equivalent star-delta circuit shown in the given figure, the values of R_{AB} and R_{BC} are respectively



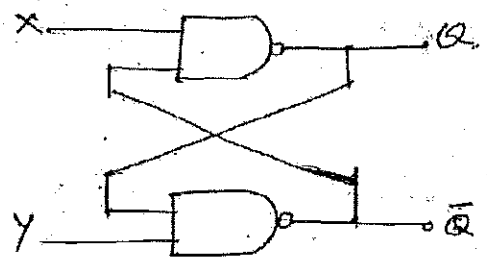
a. 5Ω and 15 Ω
b. 15 Ω and 30 Ω
c. 30 Ω and 5 Ω
d. 20 Ω and 35 Ω

4. The logic circuit given below converts a binary code Y_1 Y_2 Y_3 in to



a. Excess-3 code
b. Gray code
c. BCD code
d. Hamming code

5. For a flip flop formed from two NAND gates as shown in the figure, the unusable state corresponds to



a. X = 0, Y = 0
b. X=0, Y=1
c. X=1, Y=0
d. X=1, Y=0

6. Accuracy is specified as ±0.5% of true value. At 5% of full scale, error of the instrument will be
   a. ±0.025%
   b. ±0.5%
   c. ±2.5%
   d. ±25%

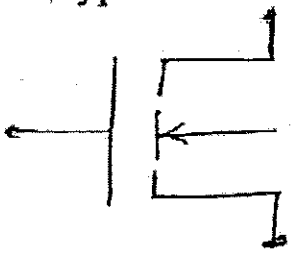
7. . An ideal OPAMP has a gain of -100. The input is connected to inverting end and the input resistance is 1kΩ. the feedback resistance is
   a. 100 kΩ
   b. 10Ω
   c. 100Ω
   d. 100kΩ

8. The Lissajous pattern on an oscilloscope has 5 horizontal tangencies and 2 vertical tangencies. The frequency of the horizontal input is 100Hz. The frequency of the vertical input will be
   a. 400Hz
   b. 2500Hz
   c. 4000Hz
   d. 5000Hz

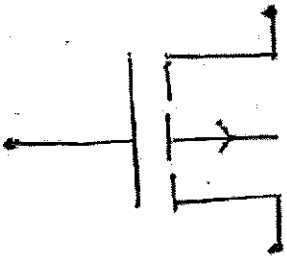
9. A thermo-couple ammeter gives full scale deflection of 10A. When it reads one fifth of the scale, the current will be
   a. 2A
   b. 4A
   c. 4.47A
   d. 5.78A

10. An enhancement type n-channel MOSFET is represented by the symbol

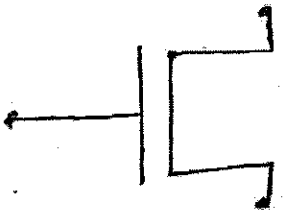
a.



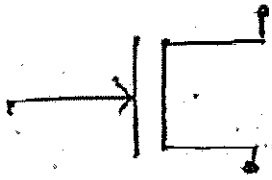
b.



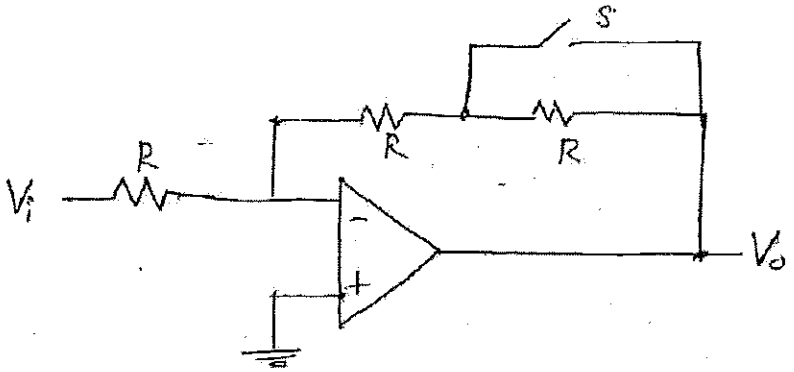
c.



d.



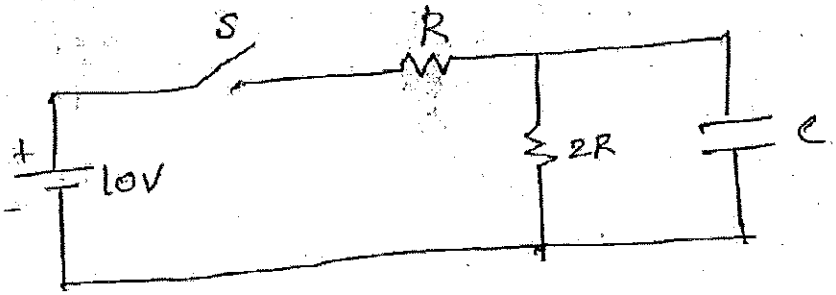
11. Magnitude of the gain in the inverting op-amp circuit shown in the figure be x with switch S1 open. When switch S1 is closed, then the magnitude of gain becomes



a. x/2
b. –x
c. 2x
d. -2x

12. A pressure gauge 0-100Pa has a guaranteed accuracy of 1% of full scale deflection. The limiting error while reading 25Pa will be
    a. 1%
    b. 2%
    c. 2.5%
    d. 4%

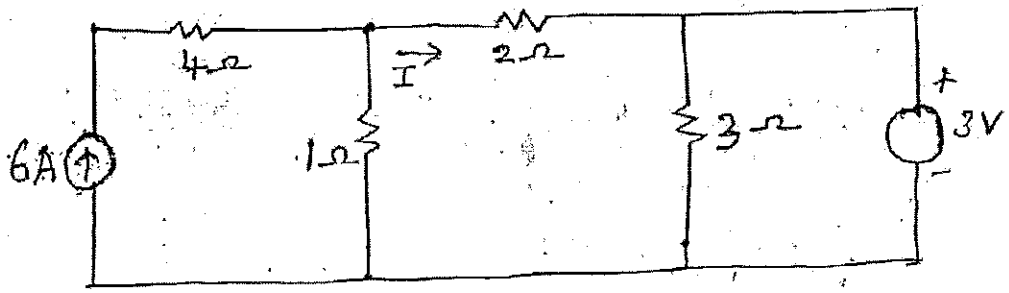
13. The time constant of the network shown in figure is



a. 2RC
b. 3RC
c. RC/2
d. 2RC/3

14. Two coils in different connection have self inductance of 2mH and 4mH and a mutual inductance of 0.15mH. the equivalent inductance of the combination is
    a. 5.7mH
    b. 5.85mH
    c. 6mH
    d. 6.15mH

15. For the circuit shown the current I is given by



    a. 3A
    b. 2A
    c. 1A
    d. Zero

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Sample Question for the Written Examination for the post of Scientific Assistant/B (CHEMISTRY)

1	In an Isochoric Process A) Pressure remains constant B) Temperature remains constant C) Volume remains constant D) Energy remains constant
2	Which among the following salt shows a decreasing solubility in water with an increase of temperature A) NH_4Cl B) KNO_3 C) NaCl D) $CaSO_4$
3	All cyclic engines working reversibly between the same temperature of source and sink have the same efficiency. This is the statement of A) Efficient engine B) Carnot Theorem C) Carnot Cycle D) 2nd law of Thermodynamics
4	The catalyst increase the rate of reaction because A) It provides the necessary energy to the colliding molecules B) It decreases the heat of the reaction C) It decreases the order of the reaction D) It provides the path for lowering the activation energy
5	If 6 gram of radioactive isotope is decayed from 12 gram in the first hour. The amount in gram that will decay in the second hour will be A) 6 B) 4.5 C) 3 D) 1.5
6	Which is heavier among the following A) 25 gram of mercury B) two moles of CO_2 C) two moles of H_2O D) one mole of Chlorine
7	Given that one mole of N2 at NTP occupies 22.4L, the density is A) 1.25 B) 0.8 C) 1.5 D) 1.6
8	The shape of dsp^2 orbital is A) Tetrahedral B) Trigonal C) Square planer D) Octahedral
9	Helium is added to oxygen supply used by deep sea divers because A) It is lighter than nitrogen B) It is not liquefied easily even at higher pressure C) It is less soluble at high pressure D) It is readily miscible with oxygen
10	Stainless steel contains A) Cr & Co B) Cr & Ni C) Ni & Co D) Cr & Cu

11	In Benzene all the six carbon-carbon bonds have the same length b'se A) Tautomerism B) Resonance C) Isomerism D) Inductive effect
12	Germanium is an example of A) Insulator B) Intrinsic semi conductor C) N type semi conductor D) P type semi conductor
13	The maximum efficiency of a heat engine operating between 125^0C and 25^0C is A) 0.80 B) 0.75 C) 0.60 D) 0.25
14	PH of 0.5 HCl is A) 5 B) 6.99 C) 0.311 D) 1.311
15	The chemical formula of Bleaching powder is A) $CaCl_2$ B) $BaOCl_2$ C) $BaCl_2$ D) $CaOCl_2$

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Sample Question for the Written Examination for the post of Scientific Assistant/B (MECHANICAL)

1	Zeroth law of thermodynamics defines the concept of (A) Internal Energy (B) Heat (C) Temperature (D) Entropy
2	The unit of Brinell hardness number is (A) No unit (B) kgf/cm (C) kgf/cm^2 (D) N/m^3
3	Hydraulic turbine converts (A) Mechanical energy into kinetic energy (B) Mechanical energy into Hydraulic energy (C) Hydraulic energy into Mechanical energy (D) Pressure energy into kinetic energy
4	Method used to produce internal gears (A) Hobbing (B) Shaper with pinion cutter (C) Milling (D) Shaper with rack cutter
5	Which of the following compression process consumes more power (A) Isothermal (B) Adiabatic (C) Irreversible adiabatic (D) Isentropic
6	Factor of safety is the ratio of (A) Yield stress to working stress (B) Maximum stress to Yield stress (C) Ultimate stress to working stress (D) Ultimate stress to Yield stress
7	The effect of friction in steam nozzle is to (A) Increase dryness fraction (B) Decrease dryness fraction (C) Decrease specific volume (D) None of the Above
8	Entropy of universe increases by (A) Isentropically (B) Adiabatically (C) Irreversible Adiabatic (D) Throttling
9	Strain is defined as (A) Change in dimension / original dimension (B) Change in area (C) Elongation of material (D) Stress x Young's Modulus
10	In refrigeration the heat rejection is ..... heat absorption (A) More than (B) Less than (C) Equal to (D) All of the above
11	Section modulus is the ratio of (A) J/y (B) J/y^2 (C) M/I (D) I/y

12	Which one of the following is low carbon steel (A) Alloy steel (B) HSS (C) Cast iron (D) Mild steel
13	Internal threads are manufactured by (A) Thread cutting (B) Taping (C) Punching (D) Reaming
14	Gas turbine power plant works on (A) Carnot cycle (B) Brayton cycle (C) Otto cycle (D) Stirling cycle
15	The firing order of 4-cylinder engine is (A) 1-2-3-4 (B) 1-4-3-2 (C) 4-1-2-3 (D) 4-3-2-1