Question Paper Preview

Subject Name: Biomedical Engineering

Display Number Panel: Yes
Group All Questions: No

Question Number : 1 Question Id : 7621612401 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $ax^2 + by^2 = k$ then $\frac{d^2y}{dx^2} =$

Options :

1. $-\frac{ak}{b^2y^3}$
2. $\frac{ak}{b^2y^3}$
3. $-\frac{a}{b^2y}$
4. $-\frac{a}{b^2y^3}$

Question Number : 2 Question Id : 7621612402 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $\int \frac{xe^x}{(1+x)^2} = p$ then p = (where c is constant of integration)

Options :

1. $x\,e^x + c$
2. $e^x(1+x) + c$
3. $\frac{1+x}{x}e^x + c$
4. $\frac{e^x}{1+x} + c$

Question Number : 3 Question Id : 7621612403 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $I = \int_0^1 \frac{1-x}{1+x}\,dx$ then I =

Options :

1. $2 \text{ Log } 2 - 1$
2. $2 \text{ Log } 2 + 1$
3. $\text{Log } 2 - 1$
4. $\text{Log } 2 + 1$

Question Number : 4 Question Id : 7621612404 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $u = sin^{-1}\frac{x^2+y^2}{x+y}$ then $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} =$

Options :

1. sin u
2. tan u
3. cosec u
4. sec u

Question Number : 5 Question Id : 7621612405 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For what value of λ the matrix $A = \begin{bmatrix} 2 & \lambda \\ 3 & 6 \end{bmatrix}$ has no inverse?

Options :

1. 1
2. 2
3. 3
4. 4

Question Number : 6 Question Id : 7621612406 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The rank of the matrix $A = \begin{bmatrix} 1 & 1 & -1 \\ 2 & -3 & 4 \\ 3 & -2 & 3 \end{bmatrix}$ is

Options :

1. 1
2. 2
3. 3
4. 4

Question Number : 7 Question Id : 7621612407 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The solution of the differential equation $\frac{dy}{dx}+1=e^{x+y}$ is

(where c is constant of integration)

Options :

1. $e^{x+y}+x+c=0$
2. $e^{x+y}-x+c=0$
3. $x+e^{-(x+y)}+c=0$
4. $x-e^{-(x+y)}+c=0$

Question Number : 8 Question Id : 7621612408 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The solution of the differential equation $sec^2x\ \tan y\,dx+\ sec^2y\ \tan x\,dy=0$ is

Options :

1. $\tan x\,.\tan y\ =c$
2. $\sec x.\ \sec y=c$
3. $x+e^{-(x+y)}+c=0$
4. $\cos x.\ \cos y=c$

Question Number : 9 Question Id : 7621612409 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $f(z)=\frac{3z+1}{(z+1)(2z-1)}$ then the residue of f(z) at the pole $z=-1$ is

Options :

1. 5/6
2. 4/5
3. 1/3
4. 2/3

Question Number : 10 Question Id : 7621612410 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If X is a Poisson variate such that P(X=1) = 3/10 and P (X= 2) = 1/5 , then the mean of the distribution is

Options :

1. 4/3
2. 3/4
3. 5/4
4. 5/3

Display Number Panel:	Yes
Group All Questions:	No

Question Number : 11 Question Id : 7621612411 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A filter may be considered as a transparent medium which enables the isolation of radiation of a particular wavelength by its _____.

Options :

1. Structure and composition only
2. Structure and colour only
3. Colour and composition only
4. Structure , composition or colour

Question Number : 12 Question Id : 7621612412 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In automated analysers, the photometric approaches that can be used as measurement techniques are reflectance photometery, fluorometry, _____ and fluoresence polarization.

Options :

1. tonometry
2. nephelometry
3. spectroscopy
4. kaleidoscopy

Question Number : 13 Question Id : 7621612413 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

With reference to pacemakers, a catheter tip electrode is inserted through the jugular or cephalic vein, into the_____, using an X-ray image intensifier television system.

Options :

1. Left atrium
2. aorta
3. right ventricle
4. Left ventricle

Question Number : 14 Question Id : 7621612414 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In voltage pacemaker the current in the circuit is determined by the available_____.

Options :

1. Contact impedance at the site
2. Resistance of the tissue
3. voltage during the entire duration of the impulse
4. voltage during the rising phase of the impulse

Question Number : 15 Question Id : 7621612415 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In an X-ray machine, _____ and _____ methods are employed for Automatic Exposure Control.

Options :

1. Image intensifier, fluoroscopy
2. Gain control protocol, photocell
3. Photocell, image intensifier
4. photocell, an ionization chamber

Question Number : 16 Question Id : 7621612416 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Grids are placed between the patient and the film cassette to reduce _____ .

Options :

1. Scattered radiation
2. Loss of contrast due to scattered radiation
3. Collision of primary radiation
4. Loss of focused radiation

Question Number : 17 Question Id : 7621612417 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In dialysate pressure control and measurement system of haemodialysis machine _____ limits the maximum negative pressure.

Options :

1. Control valve
2. Fluid valve
3. relief valve
4. Safety valve

Question Number : 18 Question Id : 7621612418 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The lung compliance is the ratio of _____ during the _____ phase in the lungs

Options :

1. volume delivered to the pressure rise , inspiratory
2. volume expelled to the pressure rise , expiratory
3. pressure rise to the volume delivered, inspiratory
4. pressure rise to the volume delivered, expiratory

Question Number : 19 Question Id : 7621612419 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Cellulose is used for_____.

Options :

1. Cell scaffold
2. Drug delivery
3. Wound dressing
4. Cosmetic surgery

Question Number : 20 Question Id : 7621612420 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The specific acoustic impedance of a medium determines the degree of _____ at its interface with the other medium .

Options :

1. Scattering and reflection
2. Transmission and scattering
3. Refraction and transmission
4. Reflection and refraction

Question Number : 21 Question Id : 7621612421 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In CT image, the patient slice is divided up into numerous _____and the image of the slice is a _____.

Options :

1. Three- dimensional voxels, two- dimensional picture
2. two dimensional pixels, two- dimensional picture
3. two dimensional voxels, two- dimensional picture
4. Three- dimensional voxels, three- dimensional picture

Question Number : 22 Question Id : 7621612422 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The amplitude and the frequency of the NMR signals are used to assign the _____ and _____ .

Options :

1. Number of projections, orientation of the gradient
2. Orientation of the gradient, number of slices
3. Number of nuclei present, spatial location
4. Number of projections, spatial location

Question Number : 23 Question Id : 7621612423 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

When a transmembrane potential difference is established, the membrane can be described electrically as a_____.

Options :

1. Perfect capacitor
2. leaky capacitor
3. Pure inductance
4. Pure resistance

Question Number : 24 Question Id : 7621612424 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The equilibrium potential for an ion calculated from Nernst equation is directly proportional to _____ and inversely proportional to _____.

Options :

1. Absolute temperature, its extracellular concentration
2. its intracellular concentration, universal gas constant
3. Absolute temperature, universal gas constant
4. Absolute temperature, its intracellular concentration

Question Number : 25 Question Id : 7621612425 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

When the membrane threshold is exceeded leading to runaway depolarization, the membrane potential tends to approach the Nernst potential of _____ , i.e. _____

Options :

1. Potassium, +20mV
2. Sodium, +60mV
3. Chlorine, -40 mV
4. Sodium, +20mV

Question Number : 26 Question Id : 7621612426 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

During an action potential propagation in an unmyelinated nerve fiber the _____ region is small relative to the fiber_____.

Options :

1. Amplitude of the activation wave, length
2. Diameter of the passive, length
3. length of the active, length
4. Diameter of the passive, diameter

Question Number : 27 Question Id : 7621612427 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The _____ relationship between horizontal angle of gaze and EOG amplitude is up to _____.

Options :

1. Second order polynomial, +30°
2. almost linear, ± 30°
3. Linear , 60°
4. Square, ± 50°

Question Number : 28 Question Id : 7621612428 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The changes in the distribution of the ions in the electrolyte in the vicinity of the electrode-electrolyte interface results in _____.

Options :

1. Ohmic over potential
2. concentration over potential
3. Diffusion potential
4. Concentration ohmic potential

Question Number : 29 Question Id : 7621612429 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The _____ plays the most important role in determining the electrode-skin interface.

Options :

1. dermis
2. Sweat glands

3. epidermis

4. Sweat ducts

Question Number : 30 Question Id : 7621612430 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Piezo-electric devices respond only to _____ inputs and have _____characteristics.

Options :

1. time-varying , no static

2. Constant, static

3. Constant, no dynamic

4. Time-varying, no dynamic

Question Number : 31 Question Id : 7621612431 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The input impedance is the ratio of the steady-state sinusoidal effort input variable namely _____ and _____to the steady-state sinusoidal flow input variable i.e., _____ and _____, respectively.

Options :

1. Voltage, force, current , velocity

2. Force, current, voltage, velocity

3. Velocity, force, current, voltage,

4. Current , velocity, force, voltage

Question Number : 32 Question Id : 7621612432 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The chemical reaction for preparing the sample to be used for spectrophotometer produces a compound such that it _____ an amount of light which depends on the _____.

Options :

1. Reflects, frequency

2. Scatters, color

3. Scatters, wavelength

4. Absorbs, wavelength

Question Number : 33 Question Id : 7621612433 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The driver amplifier _____ the ECG.

Options :

1. Only amplifies
2. Impedance matches and amplifies
3. amplifies the input and band pass filters
4. Impedance matches and band pass filters

Question Number : 34 Question Id : 7621612434 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A-mode device shows _____as an x-y plot and can be used to measure the displacement of the_____.

Options :

1. Echo amplitude, mitral valve
2. Echo distance, interventricular septum
3. echo intensity, brain midline
4. Echo amplitude, interventricular septum

Question Number : 35 Question Id : 7621612435 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Sleep EEG can detect _____ .

Options :

1. Grandmal epilepsy
2. Petitmal epilepsy
3. Narcolepsy
4. Psychomotor epilepsy

Question Number : 36 Question Id : 7621612436 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In flame photometer continuous calibration is achieved by inspiration of _____.

Options :

1. Sodium and air
2. air and lithium
3. Potassium and sodium
4. Lithium and sodium

Question Number : 37 Question Id : 7621612437 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In an EEG machine, _____ serves as the calibration signal.

Options :

1. 5-1000 μV peak-to-peak rectangular wave
2. rectangular wave of 50-100 μV peak- to-peak
3. rectangular wave of 1-500 μV peak- to-peak
4. 5-100 μV peak-to-peak rectangular wave

Question Number : 38 Question Id : 7621612438 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The pacemaker electrodes are made of_____.

Options :

1. platinum
2. Platinum-iridium alloy
3. Silver-silver chloride
4. Silver

Question Number : 39 Question Id : 7621612439 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The characteristic of the Lown waveform used for the delivering shock to the patient with a DC defibrillator is _____.

Options :

1. Rapid rise of current to about 20 A with a voltage slightly less than 3000 V
2. Rapid rise of current to about 2 A with a voltage slightly less than 3kV
3. Rapid rise of current to about 20 A with a voltage slightly less than 5kV
4. Rapid rise of current to about 2 A with a voltage slightly less than 1000 V

Question Number : 40 Question Id : 7621612440 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The peristaltic pump in a heart-lung machine produces _____.

Options :

1. Steady blood flow through the tubing
2. Steady blood flow through the blood vessels
3. Pulsatile blood flow through the tubing
4. Laminar blood flow through the blood vessels

Question Number : 41 Question Id : 7621612441 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In electrosurgical generators _____the patient plate is the same as _____the active electrode.

Options :

1. Voltage at, voltage at
2. Resistance of, resistance of
3. Current density at, current density at
4. current flowing into, the current flowing into

Question Number : 42 Question Id : 7621612442 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A rise in _____ produces a decrease in sympathetic activity and an increase in parasympathetic activity.

Options :

1. Stroke volume
2. Left ventricular pressure
3. arterial blood pressure
4. Cardiac output

Question Number : 43 Question Id : 7621612443 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Though physiological control systems are basically closed loop, a variety of techniques are applied to open loop to ease the analysis. Example of such technique is _____.

Options :

1. denervation
2. desiccation
3. coagulation
4. cauterization

Question Number : 44 Question Id : 7621612444 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Effect of respiration on the heart rate is called_____.

Options :

1. Sinus tachycardia
2. Respiratory bradycardia
3. Respiratory sinus
4. respiratory sinus arrhythmia

Question Number : 45 Question Id : 7621612445 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In warm blooded animals the _____is independent of the _____.

Options :

1. Metabolism, ambient temperature
2. Homeostasis, ambient temperature
3. Body temperature, ambient temperature
4. Homeostasis, body temperature

Question Number : 46 Question Id : 7621612446 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Among the following, the correct order which shows the materials with their elastic modulus in ascending order is ____

Options :

1. PMMA, UHMWPE, cortical bone
2. UHMWPE, cortical bone, Steel
3. PMMA, Steel, cortical bone
4. Bone, collagen,PMMA

Question Number : 47 Question Id : 7621612447 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The material used for neural stimulation devices is _____.

Options :

1. Platinum
2. Stainless steel
3. Gold
4. Silver

Question Number : 48 Question Id : 7621612448 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Ceramics are _____ and _____.

Options :

1. Easy to machine, brittle
2. Very strong , difficult to machine
3. Very biocompatible with bone, brittle
4. Very strong, easy to machine

Question Number : 49 Question Id : 7621612449 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Ligaments have _____ and _____ than tendons.

Options :

1. More collagen, less elastin
2. More elastin, less collagen
3. More elastin, more collagen
4. Less elastin, less collagen

Question Number : 50 Question Id : 7621612450 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

When blood is described as_____ , shear stress depends upon yield stress.

Options :

1. Pseudoelastic
2. Dilatant
3. Bingham plastic
4. Casson's fluid

Question Number : 51 Question Id : 7621612451 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Kelvin model is _____.

Options :

1. Maxwell model and spring in series
2. Voigt model and spring in series
3. Spring and Maxwell model in parallel
4. Maxwell model and dashpot in parallel

Question Number : 52 Question Id : 7621612452 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The area within the pressure-volume loop of the left ventricle indicates _____.

Options :

1. Aortic characteristic impedance
2. Aortic pressure and elastance
3. Left ventricular outflow
4. Left ventricular work

Question Number : 53 Question Id : 7621612453 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The ratio of change in ventricular pressure to change in ventricular volume represents _____.

Options :

1. Ventricular elastance
2. Ventricular resistance
3. Ventricular compliance
4. Ventricular modulus

Question Number : 54 Question Id : 7621612454 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Polymeric biomaterials are used for their _____.

Options :

1. hardness
2. flexibility and stability
3. wear resistance applications
4. Load bearing applications

Question Number : 55 Question Id : 7621612455 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The minimum sampling frequency required for the ADC of a digital ECG monitor is _____.

Options :

1. 100 Hz
2. 1000 Hz
3. 500 Hz
4. 300 Hz

Question Number : 56 Question Id : 7621612456 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The spike-and-wave complex of the EEG can be detected using _____.

Options :

1. Template matching
2. Wiener filter
3. HPF
4. LPF

Question Number : 57 Question Id : 7621612457 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The resultant change in force in response to a step change in the position is called _____.

Options :

1. Creep
2. Stress relaxation
3. Viscoelasticity
4. Hysteresis

Question Number : 58 Question Id : 7621612458 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The measures those can be employed to characterize QRS complex in ECG analysis are _____.

Options :

1. Slope, width, offset
2. Area, slope, duration
3. Area, height, offset
4. Slope, area,height

Question Number : 59 Question Id : 7621612459 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The symmetry between two corresponding EEG channels on the left and right can be studied by the _____.

Options :

1. Coherence function
2. Single differentiation
3. Template matching
4. Double differentiation

Question Number : 60 Question Id : 7621612460 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The sleep pattern of a subject is analyzed through _____.

Options :

1. Comb filtering
2. Template matching
3. Cross spectral density
4. Morkov model

Question Number : 61 Question Id : 7621612461 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A metal wire has a uniform cross section A, length L, and resistance R between its two end points. It is uniformly stretched so that its length becomes αL. The new resistance is:

Options :

1. αR
2. $\alpha^2 R$
3. $\alpha^{1/2} R$
4. $e^{\alpha} R$

Question Number : 62 Question Id : 7621612462 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In full sunlight, a solar cell has a short circuit current of 75 mA and a current of 70 mA for a terminal voltage of 0.6 V with a given load. The Thevenin's resistance of the solar cell is:

Options :

1. 8 Ω
2. 8.6 Ω
3. 120 Ω
4. 240 Ω

Question Number : 63 Question Id : 7621612463 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The response of a first order measurement system to a unit step input is $(1 - e^{-0.5t})$, where t is in seconds. A ramp of 0.1 units per second is given as the input to this system. The error in the measured value after transients have died down is :

Options :

1. 0.02 units
2. 0.1 units
3. 0.2 units
4. 1 unit

Question Number : 64 Question Id : 7621612464 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The root mean squared value of $x(t) = 3 + 2\,\mathrm{Sin}(t)\,\mathrm{Cos}(2t)$ is:

Options :

1. $\sqrt{3}$
2. $\sqrt{8}$
3. $\sqrt{10}$
4. $\sqrt{11}$

Question Number : 65 Question Id : 7621612465 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A 100 Ω, 1 W resistor and 800 Ω, 2 W resistor are connected in series. The maximum DC voltage that can be applied continuously to the series circuit without exceeding the power limit of any of the resistor is:

Options :

1. 90 V
2. 0 V
3. 45 V
4. 40 V

Question Number : 66 Question Id : 7621612466 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A temperature measuring instrument is modeled as a first order system with a time constant of 5 s. The sensor of the instrument is placed inside an oil bath whose temperature has a sinusoidal variation with amplitude of 10^0C and a period of 20 s around an average temperature of 200^0C. The sinusoidal component at the output of the instrument will have amplitude:

Options :

1. 0^0C
2. 5.37^0C
3. 8.57^0C
4. 10^0C

Question Number : 67 Question Id : 7621612467 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An N-type semiconductor strain gage has a nominal resistance of 1000 Ω and a gage factor of -100. The resistance of the gage, when a compressive strain of 100 μm/m is applied, is:

Options :

1. 900 Ω
2. 990 Ω
3. 1010 Ω
4. 1100 Ω

Question Number : 68 Question Id : 7621612468 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For signal conditioning of a piezo electric type transducer, we require:

Options :

1. A charge amplifier
2. A differential amplifier

3. An instrumentation amplifier

4. A transconductance amplifier

Question Number : 69 Question Id : 7621612469 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The temperature being sensed by a negative temperature coefficient (NTC) type themistor is linearly increasing. Its resistance will:

Options :

1. Linearly increase with temperature

2. Exponentially increase with temperature

3. Linearly decrease with temperature

4. Exponentially decrease with temperature

Question Number : 70 Question Id : 7621612470 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The output voltage of a transducer with an output resistance of 10 k Ω is connected to an amplifier. The minimum input resistance of the amplifier so that the error in recording the transducer output does not exceed 2% is:

Options :

1. 10 kΩ

2. 49 kΩ

3. 490 kΩ

4. 1.2 kΩ

Question Number : 71 Question Id : 7621612471 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The conventional way of expressing vibration is in terms of:

Options :

1. Ritcher scale

2. Acceleration due to gravity

3. Speed of sound

4. Atmospheric pressure

Question Number : 72 Question Id : 7621612472 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

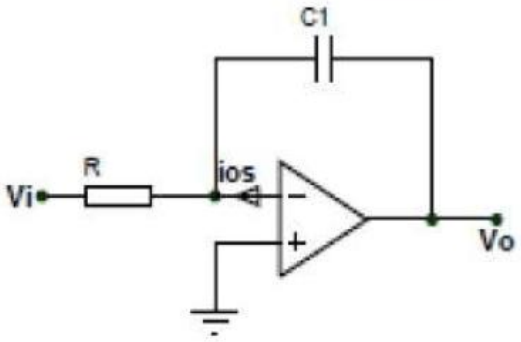
The primary and secondary of an LVDT (stroke length ±50mm) are connected to 3 kHz sinusoidal source and ideal semiconductor diode bridge based phase sensitive demodulator circuit. The core of the LVDT remains static at 15 mm above the null ideal position. The frequency of voltage observed at the input of the low pass filter is:

Options :

1. 1 kHz
2. 1.5 kHz
3. 3 kHz
4. 6 kHz

Question Number : 73 Question Id : 7621612473 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An integrator circuit is shown in figure. The op-amp is of type 741 and has an input offset current i_{os} of 1 μA. C1 is 1 μF and R is 1 M Ω. If the input V_i is a 1 kHz square wave of 1 V peak to peak, the output V_o under steady state condition will be:

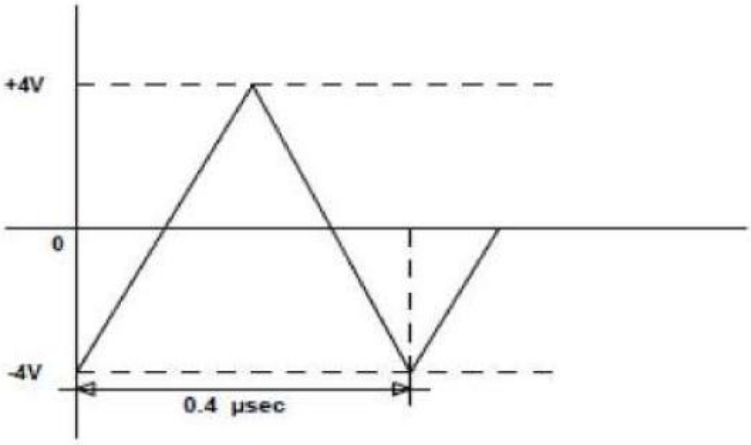


Options :

1. A square wave of 1 V peak to peak
2. A triangular wave of 1 V peak to peak.
3. Positive supply voltage $+V_{cc}$
4. Negative supply voltage $-V_{cc}$

Question Number : 74 Question Id : 7621612474 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The output of an op-amp whose input is a 2.5 MHz square wave is shown in figure. The slew rate of the op-amp is:

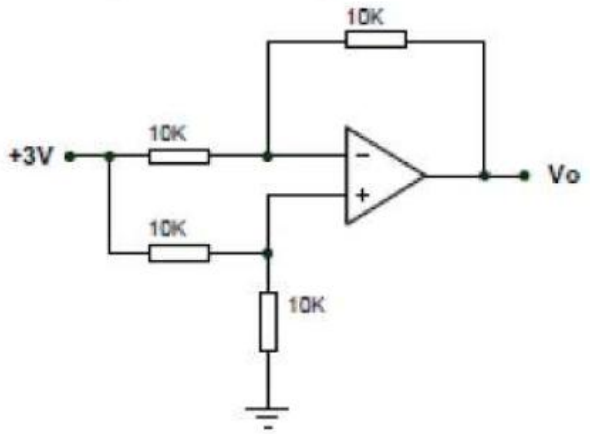


Options :

1. 0.8 V/μs
2. 8.0 V/μs
3. 20.0 V/μs
4. 40.0 V/μs

Question Number : 75 Question Id : 7621612475 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The output of the op-amp circuit shown in the figure is:



Options :

1. 0 V
2. − 3 V
3. + 1.5 V
4. + 3 V

Question Number : 76 Question Id : 7621612476 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The device shown in the figure is a:

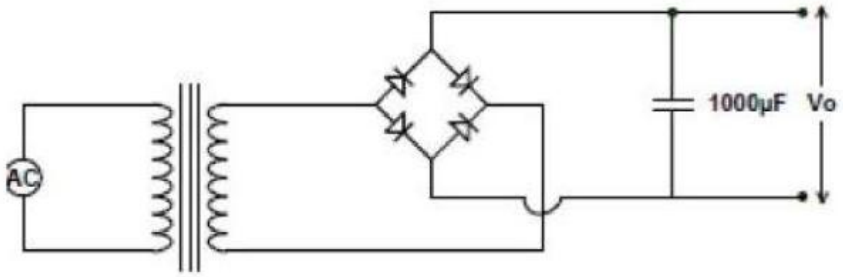


Options :

1. Variac
2. Triac
3. Quadrac
4. Diac

Question Number : 77 Question Id : 7621612477 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The peak value of the output voltage V_o across the capacitor shown in the figure for a 230 : 9 transformer and a 230 V, 50 Hz, input, assuming 0.7 V diode drop and an ideal transformer is:

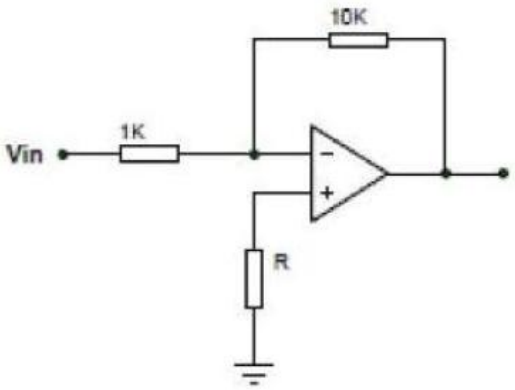


Options :

1. 12.73 V
2. 11.33 V
3. 7.6 V
4. 9.0 V

Question Number : 78 Question Id : 7621612478 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If the value of the resistance R in the following figure is increased by 50 %, then the voltage gain of the amplifier shown in the figure will change by:

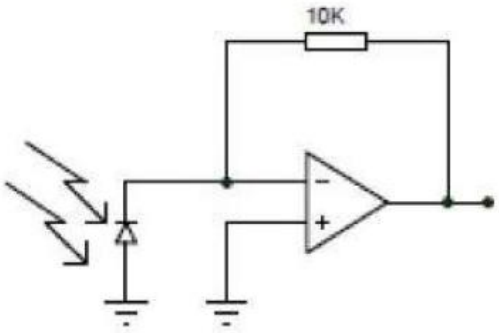


Options :

1. 50 %
2. 5 %
3. – 50%
4. Negligible amount

Question Number : 79 Question Id : 7621612479 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

When light falls on the photodiode shown in the following circuit, the reverse saturation current of the photo diode changes from 100 μA to 200 μA. Assuming the op-amp to be ideal, the output voltage V_{out} of the circuit:



Options :

1. Does not change
2. Changes from 1 V to 2 V
3. Changes from 2 V to 1 V
4. Changes from -1 V to -2 V

Question Number : 80 Question Id : 7621612480 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For a single stage BJT common base amplifier:

Options :

1. Current gain as well as voltage gain can be greater than unity.
2. Current gain can be greater than unity but voltage gain is always less than unity.
3. Voltage gain can be greater than unity but current gain is always less than unity.
4. Current gain as well as voltage gain is always less than unity.

Question Number : 81 Question Id : 7621612481 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An ideal op-amp has the characteristics of an ideal:

Options :

1. Voltage controlled voltage source
2. Voltage controlled current source
3. Current controlled voltage source
4. Current controlled current source

Question Number : 82 Question Id : 7621612482 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

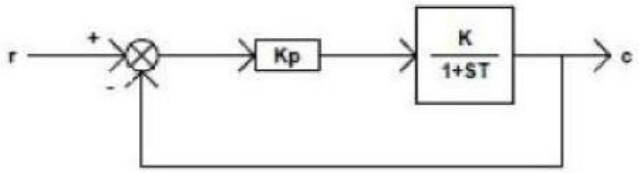
If u(t) represents the unit step function, then the Laplace transform of u(t-τ)is:

Options :

1. $\frac{1}{s\tau}$
2. $\frac{1}{s-\tau}$
3. $\frac{e^{-s\tau}}{s}$
4. $e^{-s\tau}$

Question Number : 83 Question Id : 7621612483 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The steady state error for the feedback control system shown in figure when subjected to a unit step input is:



Options :

1. Zero
2. $\frac{1}{1+KKp}$
3. $\frac{KKp}{1+KKp}$
4. Infinite

Question Number : 84 Question Id : 7621612484 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For a first order instrument a 5% settling time is equal to:

Options :

1. Three times the time constant
2. Two times the time constant
3. The single time constant
4. Time required for the output signal to reach 5% of the final value

Question Number : 85 Question Id : 7621612485 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The dominant poles of a servo system are located at S = (-2 ± j2). The damping ratio of the system is:

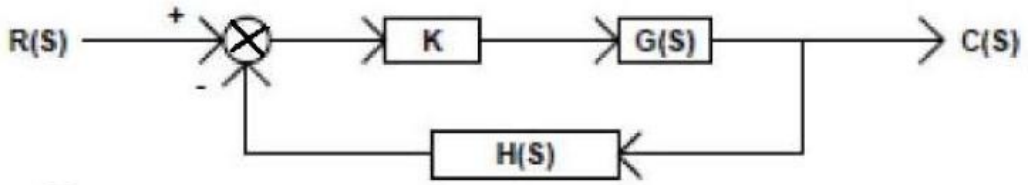
Options :

1. 1
2. 0.8
3. 0.707

4. 0.6

Question Number : 86 Question Id : 7621612486 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A feedback control system with high gain K, is shown in the figure below. Then the closed loop transfer function is:



Options :

1. Sensitive to perturbations in G(S) and H(S)
2. Sensitive to perturbations in G(S) but not perturbations in H(S)
3. Sensitive to perturbations in H(S) but not to perturbations in G(S)
4. Insensitive to perturbations in G(S) and H(S)

Question Number : 87 Question Id : 7621612487 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The open loop transfer function of a unity gain feedback system is given by $G(S) = \frac{k(s+3)}{(s+1)(s+2)}$. The range of +ve values of k for which the closed loop system will remain stable is:

Options :

1. $1 < k < 3$
2. $0 < k < 10$
3. $5 < k < \infty$
4. $0 < k < \infty$

Question Number : 88 Question Id : 7621612488 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The first two rows of Routh's table of a third order characteristic equation are

S^3	3	3
S^2	4	4

It can be inferred that the system has:

Options :

1. One real pole in the right-half of S-plane
2. A pair of complex conjugate poles in the right-half of S-plane
3. A pair of real poles symmetrically placed around S = 0

4. A pair of complex conjugate poles on the imaginary axis of the S-plane

Question Number : 89 Question Id : 7621612489 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Introducing a Schottky diode between the base and collector of the output transistor in a TTL circuit:

Options :

1. Increases the speed of operation by inhibiting saturation
2. Decreases the speed of operation by inhibiting saturation
3. Increases the FAN OUT by enabling saturation
4. Increases the speed of operation by enabling saturation

Question Number : 90 Question Id : 7621612490 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Two 4-bit 2's complement numbers 1011 and 0110 are added. The result expressed in 4-bit 2's complement notation is:

Options :

1. 0001
2. 0010
3. 1101
4. Cannot be expressed in 4-bit 2's complement

Question Number : 91 Question Id : 7621612491 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

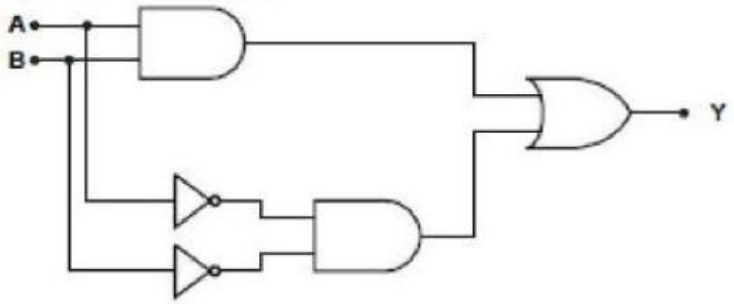
The clock frequency of a timer counter is 10 MHz. The timer counter is used in the period mode and the input to the timer-counter is a square wave of frequency 2 kHz. The display of the timer-counter will show a value of

Options :

1. 200
2. 2000
3. 5000
4. 50000

Question Number : 92 Question Id : 7621612492 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The logic circuit shown in the figure is a



Options :

1. Half adder
2. XOR
3. Equality detector
4. Full adder

Question Number : 93 Question Id : 7621612493 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The number of comparators required in an 8-bit flash-type A/D converter is

Options :

1. 256
2. 255
3. (8+2)
4. 5

Question Number : 94 Question Id : 7621612494 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

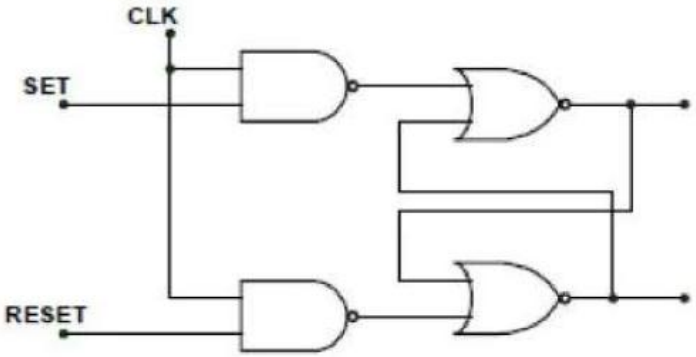
The simplest form of the Boolean expression: $AB\bar{C}\bar{D} + ABC\bar{D} + AB\bar{C}D + ABCD$ is

Options :

1. AD
2. BC
3. $\bar{A}B$
4. AB

Question Number : 95 Question Id : 7621612495 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The two NAND gates before the latch circuit shown in figure are used to:



Options :

1. Act as buffers
2. Operate the latch faster
3. Avoid the racing problem
4. Invert the latching action

Question Number : 96 Question Id : 7621612496 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

7E H and 5F H are XORed. The output is multiplied by 10 H. The result is:

Options :

1. 0210 H
2. 7E5F H
3. 5F7E H
4. 2100 H

Question Number : 97 Question Id : 7621612497 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The binary representation of the decimal number 1.375 is:

Options :

1. 1.111
2. 1.010
3. 1.011
4. 1.001

Question Number : 98 Question Id : 7621612498 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The base of the number system for the addition operation 24 + 14 = 41 to be true is:

Options :

1. 8
2. 7
3. 6

4. 5

Question Number : 99 Question Id : 7621612499 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An 8-bit microprocessor has an external RAM with a memory map from 8000 H to 9FFFFH. The number of bytes this RAM can store is:

Options :

1. 8193
2. 8191
3. 8192
4. 8000

Question Number : 100 Question Id : 7621612500 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A 2K×8 bit RAM is interfaced to an 8-bit microprocessor. If address of the memory location in the RAM is 0800 H, the address of the last memory location will be:

Options :

1. 1000 H
2. 0FFF H
3. 4800 H
4. 47FF H

Question Number : 101 Question Id : 7621612501 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A 3½ digit multimeter has an accuracy specification of (± 0.5% of reading ± 5 counts). If the meter reads 2.00 mA on a full scale of 20 mA, the worst case error in the reading is:

Options :

1. 0.5%
2. 2.5%
3. 3.0%
4. 5.5%

Question Number : 102 Question Id : 7621612502 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A shaft encoder attached to a DC motor has a sensitivity of 500 pulses per revolution. A frequency meter connected to the output of the encoder indicates the frequency to be 5500 Hz. The speed of the motor in RPM is:

Options :

1. 110
2. 220

3. 550

4. 660

Question Number : 103 Question Id : 7621612503 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The insulation level for a 5 A full scale rectifier type ammeter is specified as 2.5 kV. It is then safe to use the meter with a potential difference of upto 2.5 kV between:

Options :

1. The terminals of the meter

2. Case and the ground

3. Both the terminals and the case

4. One of the terminals and the ground

Question Number : 104 Question Id : 7621612504 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An oscilloscope is powered from 230 V mains having a nominal frequency of nearly 50 Hz. The triggering mode of the oscilloscope is set to LINE. A square wave from a function generator is fed to the Y input and a stable display (properly triggered) is obtained when the frequency of the function generator is 297 Hz. The actual frequency of the power supply is:

Options :

1. 50 Hz

2. 49.5 Hz

3. 49.0 Hz

4. 48.5 Hz

Question Number : 105 Question Id : 7621612505 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The excitation frequency of an LVDT is 2 kHz. The maximum frequency of displacement should be limited to:

Options :

1. 299 Hz

2. 1.5 kHz

3. 2 kHz

4. 2.5 kHz

Question Number : 106 Question Id : 7621612506 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A dc voltage of magnitude 11 kV is to be measured without loading the source under steady condition. The best suited instrument is:

Options :

1. A rectifier type voltmeter
2. An electro-dynamic type voltmeter
3. A megger
4. An electrostatic voltmeter

Question Number : 107 Question Id : 7621612507 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Two coils in a differential connection have self inductance of 2 mH and 4 mH and a mutual inductance of 0.15 mH. The equivalent inductance of the combination is:

Options :

1. 5.7 mH
2. 5.85 mH
3. 6 mH
4. 6.15 mH

Question Number : 108 Question Id : 7621612508 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A recording instrument requires 0.05 A to overcome initial friction and produce motion of the movement. The effect is:

Options :

1. Hysteresis of 0.05 A
2. Dead zone of 0.05 A
3. Hysteresis and dead zone each of 0.1 A
4. Hysteresis and dead zone each of 0.025 A

Question Number : 109 Question Id : 7621612509 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Johnson noise is caused by:

Options :

1. Thermal agitation of free electrons carrying current thereby modulating the current
2. Vibrations into circuit through conductors
3. Random emission of electrons across PN junction
4. Electromagnetic radiation into the circuit

Question Number : 110 Question Id : 7621612510 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Backlash is:

Options :

1. Unwanted signal tending to obscure the transducer signal

2. Maximum angle or distance through which any part of mechanical system may be moved in one direction without causing motion of the next part

3. Departure of instrument output from its calibrated value

4. All the options are correct

Question Number : 111 Question Id : 7621612511 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An inverse transducer is:

Options :

1. Potentiometer

2. LVDT

3. Piezoelectric transducer

4. Strain gauge

Question Number : 112 Question Id : 7621612512 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Range of an analog transducer is 0 – 10 V. For a resolution of 5 mV, the ADC will be of:

Options :

1. 8 bits

2. 9 bits

3. 10 bits

4. 11 bits

Question Number : 113 Question Id : 7621612513 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In a digital frequency meter; the Schmitt trigger is used for:

Options :

1. Scaling of sinusoidal waveforms

2. Providing time base

3. Converting sinusoidal waveforms into rectangular pulses

4. Generation of triangular wave

Question Number : 114 Question Id : 7621612514 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The material used for the swamping resistance that is connected in series with the working coil of a voltmeter is

Options :

1. Constantan

2. Manganin

3. Eureka

4. Nichrome

Question Number : 115 Question Id : 7621612515 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

As the temperature is increased, the voltage across a diode carrying a constant current

Options :

1. Increases

2. Decreases

3. Remains constant

4. May increase or decrease depending upon the doping levels in the junction

Question Number : 116 Question Id : 7621612516 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Class AB operation is often used in power (large signal) amplifiers in order to:

Options :

1. Get maximum efficiency

2. Remove even harmonics

3. Overcome a cross-over distortion

4. Reduce collector dissipation

Question Number : 117 Question Id : 7621612517 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Op-amp used as a tuned amplifier has the tuned circuit connected:

Options :

1. Across input

2. Across series impedance at the input

3. Across feedback impedance Z_f

4. Across output

Question Number : 118 Question Id : 7621612518 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Most of the linear ICs are based on the two-transistor differential amplifier because of its

Options :

1. Input voltage dependent linear transfer characteristics

2. High voltage gain

3. High input resistance

4. High CMRR

Question Number : 119 Question Id : 7621612519 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A memory system has a total of 8 memory chips, each with 12 address lines and 4 data lines. The total size of the memory system is:

Options :

1. 6 K bytes
2. 32 K bytes
3. 18 K bytes
4. 16 K byes

Question Number : 120 Question Id : 7621612520 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Digital multiplexer is basically a combinational logic circuit to perform the operation:

Options :

1. AND-AND
2. OR-OR
3. AND-OR
4. OR-AND