Subject Code : 617 Section Code : -Select- Difficulty: 1

Subject Code	Q Id	Questions	Answer Key
617	1501	Accuracy is defined as (A) a measure of how often an experimental value can be repeated (B) the closeness of a measured value to the real value (C) the number of significant figures used in a measurement (D) None of the above	(B)
617	1502	Germanium and Silicon photosensors have their maximum spectral response in the (A) IR region (B) UV region (C) Visible region (D) X-ray region	(B)
617	1503	Bohr's model of the atom was able to accurately explain (A) origin of spectral lines (B) the spin of an electron (C) the emission of alpha particles (D) the velocity of light in free space	(A)
617	1504	"Line Spectra" are caused primarily by (A) the existence of many ground states in an atom (B) the existence of many excited states in an atom (C) the existence of many atoms in a typical sample (D) the existence of many electrons in a typical sample	(B)
617	1505	Which types of orbital looks like a figure-8 when drawn? (A) s-orbital (B) p-orbital (C) d-orbital (D) f-orbital	(B)
617	1506	The magnetic quantum number of an orbital defines (A) the energy level of the orbital (B) the shape of the orbital (C) the spatial orientation of the orbital (D) the spin of the electrons in the orbital	(C)
617	1507	Which of the following elements has three valence electrons? (A) Lithium (B) Boron (C) Nitrogen	(B)

		(D) Sodium	
617	1508	Why doesn't pure water conduct electricity well? (A) Water has low density. (B) Pure water contains very few ions. (C) The hydrogen bonding in water cause the molecules to move slowly from on place to another. (D) There are no electrons in water.	(B)
617	1509	A second order system would be critically damped when (A) damping ratio is less than 1 (B) damping ratio is equal to 1 (C) damping ratio is greater than 1 (D) damping ratio tends to infinity	(B)
617	1510	What represents the departure of the observed reading from the arithmetic mean of the group readings? (A) Dispersion (B) Deviation (C) Variance (D) Median	(B)
617	1511	An ammeter reads 10.7A and the true value of current is 10.54A. Determine the error and correlation for this instrument. (A) 0.8, – 0. 8 (B) 0.08, – 0. 8 (C) 0.16, – 0. 16 (D) None of the above	(C)
617	1512	In a second order system, the peak overshoot is 100%. The value of damping factor is (A) 1 (B) 0.707 (C) 0 (D) 0.5	(C)
617	1513	The measured value of a capacitor is $100\mu F$. The true value of the capacitor is $110\mu F$. The percentage relative error is (A) 0.0999 (B) 0.0909 (C) 0.1 (D) 0.0476	(B)
617	1514	The maximum percentage quantization error for a 12-bit analog to digital converter is (A) $\pm 0.0076\%$ (B)	(B)

		$\pm 0.012207\%$ (C) $\pm 3.125\%$ (D) $\pm 4.17\%$	
617	1515	The energy stored per unit volume in an electric field (with usual notation) is given by (A) $2\varepsilon H^2$ (B) $(1/2)\varepsilon H^2$ (C) $(1/2)\varepsilon E^2$ (D) εH^2	(C)
617	1516	Radioactive pyrometers are used for the measurement of temperature in the range of (A) – 200^{o}C to 500 ^{o}C (B) 0^{o}C to 1200 ^{o}C (C) 500^{o}C to 1200 ^{o}C (D) 1200^{o}C to 2500 ^{o}C	(D)
617	1517	Doppler effect principles is used in the measurement of (A) temperature (B) frequency (C) speed (D) pressure	(C)
617	1518	Measurement of viscosity involves measuring (A) fictional force (B) coriolis force (C) centrifugal force (D) buoyant force	(A)
617	1519	A sound intensity level of 60 dB corresponds to (A) $10^{-6} W/cm^2$ (B) $10^{-10} W/cm^2$ (C) $10^{-16} W/cm^2$ (D) $10^{-62} W/cm^2$	(A)
617	1520	The Gunn diode is made from (A) silicon	(C)

		(B) germanium (C) gallium arsenide (D) selenium	
617	1521	The voltage gain of a given common source JFET amplifier depends on its (A) input impedance (B) amplification factor (C) dynamic drain resistance (D) drain and load resistance	(D)
617	1522	Which of the following will serve as a donor impurity in silicon? (A) Boron (B) Indium (C) Germanium (D) Antimony	(D)
617	1523	A difference amplifier is invariably used in input stage of all OPAMPs. This is done basically to provide the OPAMPs with a very high (A) CMRR (B) bandwidth (C) slew rate (D) open loop gain	(A)
617	1524	The Fourier transform of a Guassian time pulse is (A) uniform (B) a pair of impulse (C) Gaussian (D) Rayleigh	(C)
617	1525	In an amplitude modulated system, the total power radiated is 600W. The power of the carrier is 400 W. What is the modulation index? (A) 1 (B) 0.5 (C) 0.75 (D) None of the above	(A)
617	1526	Which one of the following blocks is not common in both AM and FM receiver? (A) RF amplifier (B) Mixer (C) IF amplifier (D) Slope detector	(D)
617	1527	One decibel represents a power ratio of (A) 1.26:1 (B) 0.084027777777778	(A)

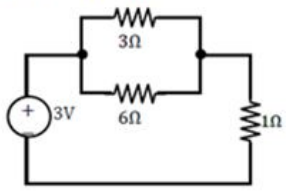
		(C) 0.41736111111111 (D) 0.83402777777778	
617	1528	Frequency shift keying is used mostly in (A) radio transmission (B) telegraphy (C) telephony (D) None of the above	(B)
617	1529	The switching time of LEDs is of the order of (A) 1s (B) 1ms (C) $1\ \mu$s (D) 1 ns	(D)
617	1530	What is the numerical aperture of an optical fiber when its critical angle is 30^o? (A) 0.5 (B) 0.704 (C) 0.866 (D) 0.2	(D)
617	1531	If the position of an object is plotted vertically on a graph and the time is plotted horizontally, the instantaneous velocity at a particular time is (A) the height of the curve at that time (B) the total length of the curve (C) the slope of the tangent to the curve at that time (D) the area under the curve from zero to that time	(C)
617	1532	An object is at $x = -3m$ and has a velocity of 4 m/s. It is observed to be slowing down. Its acceleration is (A) positive (B) negative (C) zero (D) negative until the object stops and the positive	(B)
617	1533	If two block of different masses slide freely down the same frictionless incline, which one of the following is true? (A) They have equal accelerations (B) They have unequal accelerations, but the forces acting on them are equal (C) The more massive block reaches the bottom first (D) The less massive block reaches the bottom first	(A)
617	1534	Wire-wound resistors are used only when (A) precision is essential (B) low values are required	(C)

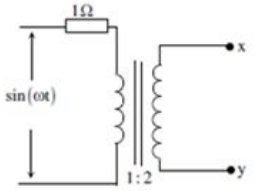
		(C) high power rating is necessary (D) costly equipments are manufactured	
617	1535	A resistance thermometer has a temperature coefficient of resistance 10^{-3} per degree and to resistance at 0°C is $10\,\Omega$. At what temperature is its resistance $1.1\,\Omega$? (A) 100°C (B) 1000°C (C) 1200°C (D) –100°C	(B)
617	1536	As per Curie-Weiss law, the magnetic susceptibility of a material varies as (A) T^{-2} (B) $1/T$ (C) T (D) T^{2}	(B)
617	1537	When light strikes the p-type semiconductor in a pn junction solar cell, (A) only free electrons are created (B) positive protons are created (C) both electrons and holes are created (D) None of the above	(C)
617	1538	Reverse biasing of a pn junction tends to (A) increase the potential difference across a junction, thereby encouraging diffusion (B) decrease the potential difference across a junction, thereby encouraging diffusion (C) decrease the potential difference across a junction, thereby inhibiting diffusion (D) increase the potential difference across a junction, thereby inhibiting diffusion	(D)
617	1539	A Josephson junction is a junction of (A) two ordinary conductors (B) an ordinary conductor and a superconductor (C) an insulator and a superconductor (D) two superconductors	(D)
617	1540	The energy of a photon of visible light is of the order of (A) $10^{-6}\,eV$ (B) $10^{-3}\,eV$	(C)

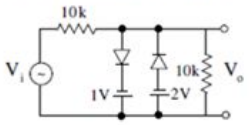
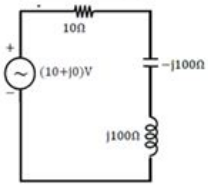
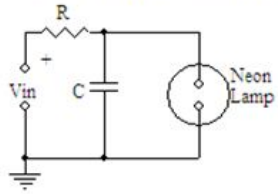
		(C) $1\ eV$ (D) $10^3 eV$	
617	1541	Which of the following characteristic X-ray lines results from the least energetic transition? (A) K_α (B) K_β (C) K_γ 1 (D) All of these characteristic X-ray lines are the same	(A)
617	1542	In the photoelectric effect, the work function depends on the (A) incident wavelength (B) metal that the light strikes (C) applied voltage (D) current	(B)
617	1543	Four unequal resistors are connected in a parallel circuit. Which one of the following statements is correct about this circuit? (A) The total resistance is less than the smallest resistor (B) The total resistance is equal to the average of the resistance of all the resistors (C) The total resistance is equal to sum of the four resistors (D) The total resistance is more than the largest resistor	(A)
617	1544	Which one of the following is the correct expression for the Heisenberg uncertainty principle? (A) $\Delta p_y\ \Delta y \geq h/2\pi$ (B) $\Delta p_y\ \Delta y \leq h/2\pi$ (C) $\Delta p_y / \Delta y \geq h/2\pi$ 1 (D) $\Delta y / \Delta p_y \geq h/2\pi$	(A)
617	1545	Which one of the following mathematical expressions is correct for constructive interference for two beams of light in the double slit experiment? (A) Path Difference $= (m-1/2)\lambda,\ m = 0, \pm 1, \pm 2, \ldots$ (B) Path Difference $= \lambda / m,\ \ m = 0, \pm 1, \pm 2, \ldots$ (C) Path Difference $= m\lambda,\ m = 0, \pm 1, \pm 2, \ldots$ 1 (D) Path Difference $= m\lambda^2,\ m = 0, \pm 1, \pm 2, \ldots$	(C)

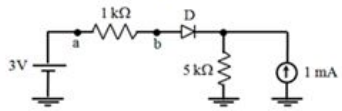
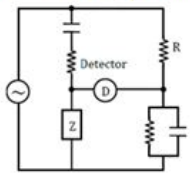
617	1546	In a single-slit diffraction experiment, the width of the slit through which light passes is reduced. What happens to the central bright fringe? (A) It stays the same (B) It becomes narrower (C) It becomes wider (D) We must know the wavelength of the light to answer	(A)
617	1547	A resistor is connected to an AC power supply. On this circuit, the current (A) leads the voltage by 90^o (B) lags the voltage by 90^o (C) is in phase with the voltage (D) leads the voltage by 45^o	(C)
617	1548	If the number of turns in a rectangular coil of wire that is rotating in a magnetic field is doubled, what happens to the induced emf, assuming all the other variables remain the same? (A) It stays the same (B) It is reduced by a factor of 4 (C) It is reduced by a factor of 2 (D) It is doubled	(D)
617	1549	A transformer is based on a principle of (A) self inductance (B) direct current (C) capacitance (D) mutual inductance	(D)
617	1550	The length of a certain wire is doubled and at the same time its radius is tripled. What is the change in the resistance of this wire? (A) It stays the same. (B) It is reduced by a factor of 4.5 (C) It is doubled (D) It is tripled	(B)
617	1551	Ohm's law relates to the electric field E, conductivity σ and current density J as (A) $J = E / \sigma$ (B) $J = \sigma E^2$ (C) $J = \sigma E$ 1 (D) $J = \sigma / E$	(C)
617	1552	The Fermi-Dirac occupancy probability, P(E) varies between (A) 0 and 1	(A)

		(B) 0 and infinity (C) 1 and infinity (D) – 1 and 1	
617	1553	The Compton shift is equal to Compton wavelength when the scattering angle is (A) 0^o (B) 90^o (C) 45^o (D) 180^o	(B)
617	1554	What is the order of magnitude of paralysis time of GM counter? (A) 1 second (B) 100 milliseconds (C) 200 microseconds (D) 5 minutes	(B)
617	1555	What is taken along with argon gas in GM tube for quenching purpose? (A) Water (B) Bromine (C) Oxygen (D) Common salt	(B)
617	1556	What is the typical operating voltage for a GM counter? (A) 1 volt (B) 50 volts (C) 800 volts (D) 1 millivolt	(C)
617	1557	In Young's double slit experiment, the two slits act as coherent sources of equal amplitude A and of wavelength l. In another experiment with the same setup, the two slits are sources of equal amplitude A and wavelength l but are incoherent. The ratio of the intensity of light at the midpoint of the screen in the first case of that in the second case is (A) 0.042361111111111 (B) 1 : 2. (C) 2 : 1. (D) √2 : 1.	(C)
617	1558	Resolving power of the prism depends on (A) base of the prism (B) angle of the prism (C) Transmission of the prism (D) angle of minimum deviation	(A)
617	1559	In decibels, the gain 100 is given as (A) 10 dB	(D)

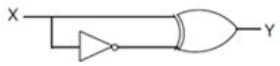
		(B) 20 dB (C) 30 dB (D) 40 dB	
617	1560	The effect that explains the splitting of spectral lines by external magnetic field is known as (A) Stark effect (B) Zeeman effect (C) Raman effect (D) Compton effect	(B)
617	1561	If λ_m is the wavelength of the radiation emitted with maximum energy in the spectrum of blackbody, and T is the Kelvin temperature, then Wien's displacement law states that the wavelength λ_m is proportional to (A) 1/T (B) $1/T^2$ (C) $1/T^3$ (D) $1/T^5$	(A)
617	1562	Four 20 mfd capacitors are connected in series. Its effective value is (A) 10 mfd (B) 80 mfd (C) 40 mfd (D) 5 mfd	(D)
617	1563	For the materials having PTC (positive temperature coefficient) of resistivity, increase in temperature, (A) increases the resistivity (B) decreases the resistivity (C) keeps the resistivity constant (D) the change in resistivity can't be determined	(A)
617	1564	In a tuned LC circuit, if 'L' is decreased what would happen to the resonant frequency? (A) remains same (B) decreases (C) increases (D) can't be determined	(C)
617	1565	The power supplied by the dc voltage source in the circuit shown below is  	(D)

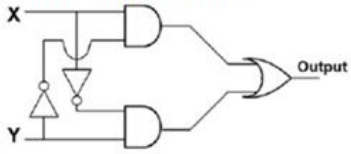
		(A) 0 W (B) 1.0 W (C) 2.5 W (D) 3.0 W	
617	1566	Norton's theorem states that a complex network connected to a load can be replaced with an equivalent impedance in (A) series with a current source (B) parallel with a voltage source (C) parallel with a current source (D) series with a voltage source	(C)
617	1567	The dimensional formula for density is (A) ML^{-1} (B) ML^{-2} (C) ML^{-3} (D) None of the above	(C)
617	1568	Assuming an ideal transformer, the Thevenin's equivalent voltage and impedance as seen from the terminals x and y for the circuit in figure are  (A) $2\sin(\omega t),\ 4\Omega$ (B) $1\sin(\omega t),\ 1\Omega$ (C) $1\sin(\omega t),\ 2\Omega$ (D) $2\sin(\omega t),\ 0.5\Omega$	(A)
617	1569	The unit of pressure in SI units is (A) Pascal (B) Fermi (C) Joule (D) Erg	(A)
617	1570	The gain magnitude of 1 kHz, - 40 dB/decade low-pass filter for the 100 kHz noise would be (A) – 20 dB (B) – 40 dB (C) – 60 dB (D) – 80 dB	(D)

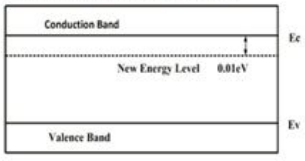
617	1571	Assuming the diodes to be ideal in the figure, for the output to be clipped, the input voltage v_i must be outside the range  (A) – 1 V to – 2 V (B) – 2 V to – 4 V (C) + 1 V to – 2 V (D) + 2 V to – 4 V	(B)
617	1572	For the circuit shown below, the voltage across the capacitor is  (A) (10 + j 0) V (B) (100 + j 0) V (C) (0 + j 100) V (D) (0 – j 100) V	(D)
617	1573	In the circuit given below, the neon lamp flickers at a rate set by 'R', 'C' and 'Vin'. If 'C' is decreased what would happen to the rate of flickering?  (A) increase (B) decrease (C) remains same (D) can't be determined	(A)
617	1574	For static magnetic field, Maxwell's curl equation is given by (A) $\nabla . \vec{B} = \mu_0 \vec{j}$ (B) $\nabla \times \vec{B} = 0$ (C) $\nabla \times \vec{B} = \mu_0 \vec{j}$ (D) $\nabla \times \vec{B} = \mu_0 / \vec{j}$	(C)
617	1575		(B)

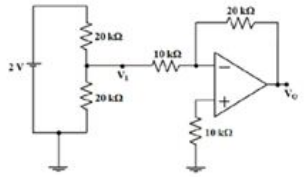
		The diode D used in the circuit below is ideal. The voltage drop V_{ab} across the 1kΩ resistor in volt is  (A) 2 (B) 0 (C) 3 (D) 5	
617	1576	The conventional way of expressing vibration is in terms of (A) Richter scale (B) acceleration due to gravity (C) speed of sound (D) atmospheric pressure	(B)
617	1577	Which one of the following is used as a high power microwave oscillator? (A) Thyratron (B) Magnetron (C) Klystron (D) Reflex-klystron	(B)
617	1578	If the ac bridge circuit shown below is balanced the elements Z can be a  (A) Pure capacitor (B) Pure inductor (C) R-L series combination (D) R-L parallel combination	(A)
617	1579	Which one of the following is associated with Poynting vector? (A) Power flow in electromagnetic field (B) Flux in magnetic field (C) Charge in electrostatic field (D) Current in electrostatic field	(A)
617	1580	A chopper is a (A) AC – AC converter (B) AC – DC converter (C) DC – AC converter (D) DC – DC converter	(D)

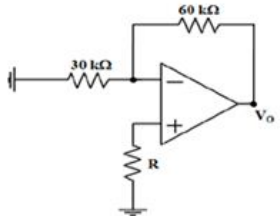
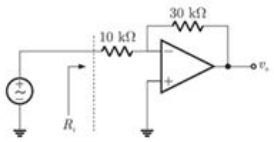
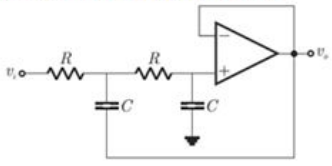
617	1581	The amount of heat required to raise the temperature of a unit mass of a substance by $1^{o}K$ is (A) specific heat (B) thermal capacity (C) calories (D) latent heat	(A)
617	1582	A freshly prepared radioactive source of half-life 2 hours emits radiation of intensity which is 64 times the permissible safe level. The minimum time after which it would be possible to work safely with the source is (A) 6 hours (B) 12 hours (C) 24 hours (D) 48 hours	(B)
617	1583	The ability of a receiver to separate two signals of closely placed frequencies is known as (A) Sensitivity (B) S/N Ratio (C) Selectivity (D) gain	(C)
617	1584	Compared to a bipolar transistor, the JFET has much higher (A) voltage gain (B) input resistance (C) supply voltage (D) current	(B)
617	1585	Diffusion of free electrons across the junction of an unbiased diode produces (A) Forward bias (B) reverse bias (C) breakdown (D) the depletion layer	(D)
617	1586	Let vectors $\mathbf{a} = 2\,\mathbf{i} + \mathbf{j} - \mathbf{k}$, and $\mathbf{b} = \mathbf{i} + 2\,\mathbf{j} + \mathbf{k}$, the angle between the vectors **a** and **b** is (A) $\pi/2$ (B) $\pi/3$ (C) $2\pi/3$ (D) $\pi/8$	(B)
617	1587	If **A**, **B**, **C** and **D** are vectors such that, **C** = **A** x **B**, and **D** = **B** x **A**, then the angle between the vectors **C** and **D** is (A) 0^{o} (B) 90^{o} (C) 180^{o} (D) 270^{o}	(C)

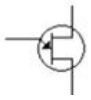
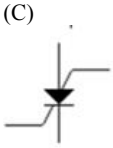
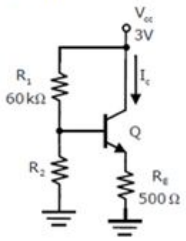
617	1588	Differentiating the function, $f(x) = 6x^9 - 2x + \frac{1}{x}$ we get (A) $6x^8 - 2 + \frac{1}{x}$ (B) $54x^8 - 2 - \frac{1}{x^2}$ (C) $54x^9 - 2 + \frac{1}{x}$ (D) None of the above	(B)
617	1589	If $\begin{bmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{bmatrix}$ = (a-b) (b-c) (c-a), then $\begin{bmatrix} 1 & 2 & 4 \\ 1 & 4 & 16 \\ 1 & 8 & 64 \end{bmatrix}$ = (A) 46 (B) 48 (C) 84 (D) 64	(B)
617	1590	The output Y of the logic circuit given below is  (A) '1' (B) '0' (C) X (D) $\bar{X}$	(A)
617	1591	Which one of the following is invalid state in an 8-4-2-1 binary coded decimal counter? (A) 1 0 0 1 (B) 1 0 0 0 (C) 0 0 1 1 (D) 1 1 0 0	(D)
617	1592	In a half-subtractor circuit with X and Y as inputs, the borrow (M) and difference (N = X – Y) are given by: (A) $M = X \oplus Y \text{ and } N = XY$ (B) $M = XY \text{ and } N = X \oplus Y$ (C) $M = XY \text{ and } N = X \oplus Y$	(C)

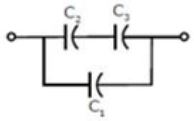
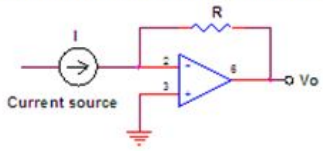
		(D) $M = XY \text{ and } N = \overline{X \oplus Y}$	
617	1593	Find out the current output of 4-bit DAC based on R-2R ladder network for a digital input of 1011. The ladder network has resistor values of R = 10kΩ and the reference voltage is 10V. (A) 0.5 mA (B) 0.6875 mA (C) 1.05 mA (D) 1.6875 mA	(B)
617	1594	The range of signed decimal numbers that can be represented by 6-bits 1's complement number is (A) –31 to +31 (B) –63 to +63 (C) –64 to +63 (D) –32 to +31	(A)
617	1595	The Boolean expression $AC + B\bar{C}$ is equivalent to (A) $\bar{A}C + B\bar{C} + AC$ (B) $\bar{B}C + AC + B\bar{C} + \bar{A}C\bar{B}$ (C) $\bar{C} + \bar{B}C + ABC$ (D) $ABC + \bar{A}B\bar{C} + AB\bar{C} + A\bar{B}C$	(D)
617	1596	In the circuit shown below, the logic evaluated at the output is  (A) $X\bar{Y} + \bar{X}Y$ (B) $\overline{(X+Y)}XY$ (C) $\bar{X}\bar{Y} + \acute{X}Y$ (D) $\bar{X}Y + X\bar{Y} + X + Y$	(A)
617	1597	Decimal 43 in Hexadecimal and BCD number system is respectively (A) B2 and 0100 011 (B) 2B and 0100 0011 (C) 2B and 0011 0100 (D) B2 and 0100 0100	(B)

617	1598	The 16-bit 2's complement form of an integer is 1111 1111 1111 0101. What is its decimal representation? (A) 10 (B) – 11 (C) – 10 (D) – 7	(B)
617	1599	In a piezoelectric crystal, application of a mechanical stress would produce (A) plastic deformation of the crystal (B) magnetic dipoles in the crystal (C) electrical polarization in the crystal (D) shift in the Fermi level	(C)
617	1600	A memory device has 16 bit address bus. How many locations are there? (A) 4K (B) 16K (C) 64K (D) 128K	(C)
617	1601	A low-pass filter with a cut-off frequency of 30Hz is cascaded with a high-pass filter with a cut-off frequency of 20Hz. The resultant system of filters will function as (A) an all-pass filter (B) an all-stop filter (C) a band-stop (band-reject) filter (D) a band–pass filter	(D)
617	1602	Drift current in the semiconductor depends upon (A) only the electric field (B) only the carrier concentration gradient (C) both the electric field and the carrier concentration (D) both the electric field and the carrier concentration gradient	(C)
617	1603	A small percentage of impurity is added to an intrinsic semiconductor at 300 K. Which one of the following statements is TRUE for the energy band diagram shown in the following figure?  (A) Intrinsic semiconductor doped with pentavalent atoms to form n-type semiconductor (B) Intrinsic semiconductor doped with trivalent atoms to form n-type emiconductor (C) Intrinsic semiconductor doped with pentavalent atoms to form p-type semiconductor (D) Intrinsic semiconductor doped with trivalent atoms to form p-type semiconductor	(A)
617	1604	In bipolar transistors, dc current gain is (A)	(B)

		$\frac{I_C}{I_E}$ (B) $\frac{I_C}{I_B}$ (C) $\frac{I_E}{I_B}$ (D) $\frac{I_E}{I_C}$	
617	1605	The concentration of minority carriers in an extrinsic semiconductor under equilibrium is (A) Directly proportional to doping concentration (B) Inversely proportional to the doping concentration (C) Directly proportional to the intrinsic concentration (D) Inversely proportional to the intrinsic concentration	(A)
617	1606	The bandgap of Silicon at room temperature is (A) 1.3 eV (B) 0.7 eV (C) 1.1 eV (D) 1.4 eV	(C)
617	1607	In the circuit given below, the op amp is ideal, the output voltage Vo in volt is  (A) 1 (B) –1 (C) 2 (D) –2	(B)
617	1608	Which of the following amplifiers offers high common mode rejection? (A) non-inverting amplifier (B) differential amplifier (C) instrumentation amplifier (D) isolation amplifier	(D)
617	1609		(A)

		In the circuit given below, each input terminal of the op amp draws a bias current of 10 nA. The effect due to these input bias currents on the output voltage V_O will be zero, if the value of R chosen is  (A) 20 kΩ (B) 30 kΩ (C) 60 kΩ (D) 90 kΩ	
617	1610	The input resistance R_i of the amplifier shown in the figure is  (A) $\frac{30}{4}$kΩ (B) 10 kΩ (C) 40 kΩ (D) infinite	(B)
617	1611	The circuit in the figure is a  (A) low-pass filter (B) high-pass filter (C) band-pass filter (D) band reject filter	(A)
617	1612	A fan motor is classified into which of the following types? (A) ac induction motor (B) dc motor (C) stepper motor (D) servomotor	(A)
617	1613	Identify a diac symbol	(D)

		(A)  (B)  (C)  (D) 	
617	1614	In the circuit shown below, the silicon n-p-n transistor Q has a very high value of β. If I_C = 1mA, what is the value of R_2?  (A) 20 kΩ (B) 30 kΩ (C) 40 kΩ (D) 50 kΩ	(C)
617	1615	Gain '0.707' is given in decibels as (A) 3 dB (B) –3 dB (C) 0 dB (D) 0.707 dB	(B)
617	1616	The phase shift provided by each RC network in a phase shift oscillator is (A) 0^o (B) 30^o (C) 60^o (D) 90^o	(C)
617	1617		(C)

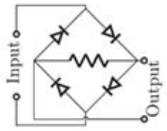
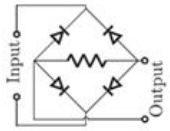
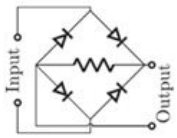
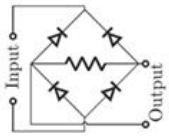
		Three capacitors C_1, C_2 and C_3 whose values are 10μF, 5μF, and 2μF respectively, have breakdown voltages of 10V, 5V, and 2V respectively. For the interconnection shown below, the maximum safe voltage in Volts that can be applied across the combination, and the corresponding total charge in μC stored in the effective capacitance across the terminals are respectively.  (A) 2.8 and 36 (B) 7 and 119 (C) 2.8 and 32 (D) 7 and 80	
617	1618	Identify the circuit shown in the following figure.  (A) voltage to current converter (B) current to voltage converter (C) non-inverting amplifier (D) unity gain amplifier	(B)
617	1619	The gain of the amplifier used in inverting mode in the phase shift oscillator should be at least (A) 1 (B) 2 (C) 10 (D) 29	(D)
617	1620	A diode that has a negative resistance characteristics is the (A) Schottky diode (B) tunnel diode (C) laser diode (D) hot-carrier diode	(B)
617	1621	In 8085 microprocessor, how are the carry (C), and zero (Z) flags of flag register affected after performing the addition of 55H and 66H? (A) C = 1, Z = 1 (B) C = 1, Z = 0 (C) C = 0, Z = 1 (D) C = 0, Z = 0	(D)
617	1622	(A) 32H	(A)

		(B) 00H (C) FFH (D) CDH	
617	1623	In 'DMA write' operation, the data transfer takes place (A) from memory to memory (B) from memory to output device (C) from input device to memory (D) from input device to output device	(C)

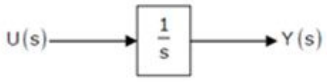
617	1624	In 'C' programming, which one of the following 'for' loop is **not correct**?
		(A)
		`for(; x < 10 ;)`
		(B)
		`for(;  ;  ;)`
		(C)
		`for(;  ;)`
		(D)
		`for (x=0 ; x != 123;)`
			(B)

617	1625	In an 8085 microprocessor, the contents of the accumulator and the carry flag are A7H and '0', respectively. If the instruction RLC is executed, then the contents of the accumulator and the carry flag, respectively, will be (A) 4EH and '0' (B) 4EH and '1' (C) 4FH and '0' (D) 4FH and '1'	(D)
617	1626	Basic function of a transducer is (A) to convert energy from one form to another form (B) to amplify the signal (C) to process the signal (D) to display the signal	(A)
617	1627	Which of the following sensors is used in displacement measurements? (A) RTD (B) LVDT (C) Piezoelectric sensor (D) Potentiometer	(B)
617	1628	Anti-aliasing filter is a (A) low-pass filter (B) high-pass filter (C) band-pass filter (D) notch filter	(A)
617	1629		(A)

		Sampling theorem states that, if f_s is the sampling frequency and f_H is the highest frequency in the signal, then (A) $f_s > 2f_H$ (B) $f_s < 2f_H$ (C) $2f_s > f_H$ (D) $2f_s < 2f_H$	
617	1630	Match the Following P. Radiation Pyrometer — W. Angular velocity measurement Q. Dall tube — X. Vacuum pressure measurement R. Pirani gauge — Y. Flow measurement S. Gyroscope — Z. Temperature measurement (A) $P \rightarrow Z, Q \rightarrow W, R \rightarrow X, S \rightarrow Y$ (B) $P \rightarrow Z, Q \rightarrow Y, R \rightarrow X, S \rightarrow W$ (C) $P \rightarrow W, Q \rightarrow X, R \rightarrow Y, S \rightarrow Z$ (D) $P \rightarrow Z, Q \rightarrow X, R \rightarrow W, S \rightarrow Y$	(B)
617	1631	The torque in a rotating shaft is measured using strain gauges. The strain gauges must be positioned on the shaft such that the axes of the strain gauges with respect to the axis of the shaft are at (A) 0^o (B) 30^o (C) 45^o (D) 90^o	(C)
617	1632	Load cells are used for the measurement of (A) weight (B) velocity (C) stress (D) acceleration	(A)
617	1633	In infrared spectroscopy, which one of the following frequency ranges is known as finger print region? (A) 4000 - 2000 cm^{-1} (B) 2000 -1450 cm^{-1} (C) 1450 - 500 cm^{-1} (D) 500 - 200 cm^{-1}	(C)

617	1634	Which one of the following is a particle accelerator? (A) Nuclear reactor (B) Geiger-Miller counter (C) Cyclotron (D) None of the above	(C)
617	1635	An alpha particle and a deutron projected with equal kinetic energies describe circular paths of radii r1 and r2 respectively in a uniform magnetic field. The ratio r1/r2 is (A) 1 (B) 2 (C) $\sqrt{2}$ (D) $\sqrt{\frac{1}{2}}$	(D)
617	1636	The correct full-wave rectifier circuit is (A)  (B)  (C)  (D) 	(C)
617	1637	The differential amplifier has +100 mV applied to non-inverting end and +250 mV applied at inverting end. The output is 1.5 V. The gain of the amplifier is (A) 10 (B) 4.29 (C) 0.6 (D) 15	(A)
617	1638	Which of the following pulse modulation systems is analog? (A) PCM (B) Differential PCM (C) PWM (D) Delta	(C)

617	1639	If the output of a voltage regulator varies from 20 V to 19.8 V when the line voltage varies over its specified range, the source regulation is (A) 0 (B) 0.01 (C) 0.02 (D) 0.05	(B)
617	1640	A phase splitter produces two output voltages that are (A) equal in phase (B) unequal in amplitude (C) opposite in phase (D) very small	(C)
617	1641	When a crowbar is used with a power supply, the supply needs to have a fuse or (A) adequate trigger current (B) holding current (C) filtering (D) current limiting	(D)
617	1642	Which of the following statements is **correct?** (A) BJT and MOSFET are current controlled devices (B) BJT is voltage controlled and MOSFET is current controlled devices (C) BJT and MOSFET are voltage controlled devices (D) BJT is current controlled and MOSFET is voltage controlled devices	(D)
617	1643	The Q factor of a coil at the resonant frequency 1.5 MHz of an RLC series circuit is 150. The bandwidth is (A) 225 MHz (B) 1.06 MHz (C) 10 kHz (D) 1 kHz	(C)
617	1644	Which of the following temperature sensors generate current output proportional to temperature? (A) Pt-100 (B) J-type thermocouple (C) AD590 (D) LM335	(C)
617	1645	The impulse response of a continuous time system is given by $h(t) = \delta(t-1) + \delta(t-3)$. The value of the step response at $t = 2$ is (A) 0 (B) 1 (C) 2 (D) 3	(B)

617	1646	The Dirac delta function δ(t) is defined as (A) $\delta(t) = \begin{cases} 1 & t = 0 \\ 0 & otherwise \end{cases}$ (B) $\delta(t) = \begin{cases} \infty & t = 0 \\ 0 & otherwise \end{cases}$ (C) $\delta(t) = \begin{cases} 1 & t = 0 \\ 0 & otherwise \end{cases} \quad and \int_{-\infty}^{\infty} \delta(t)dt = 1$ (D) $\delta(t) = \begin{cases} \infty & t = 0 \\ 0 & otherwise \end{cases} \quad and \int_{-\infty}^{\infty} \delta(t)dt = 1$	(D)
617	1647	The rise time of a second-order underdamped system is the time taken by the output to rise (A) from 10% to 90% of its final steady-state value (B) from 0% to 100% of its final steady-state value (C) from 5% to 95% of its final steady-state value (D) from 0% to 50% of its final steady-state value	(B)
617	1648	The Laplace Transform of impulse function is (A) zero (B) one (C) 1/s (D) None of the above	(B)
617	1649	Assuming zero initial condition, the response y(t) of the system given below to a unit step input u(t) is  (A) $u(t)$ (B) $t\,u(t)$ (C) $\frac{t^2}{u}u(t)$ (D) $e^{-t}u(t)$	(B)
617	1650	The transfer function is defined as the Laplace Transform of the response for a (A) step input (B) impulse input (C) ramp input	(B)

		(D) parabolic input	