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10MAT11

First Semester B.E. Degree Examination, June 2012
Engineering Mathematics – I

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer any FIVE full questions, choosing at least two from each part.***
2. ***Answer all objective type questions only on OMR sheet page 5 of the answer booklet.***
3. ***Answer to objective type questions on sheets other than OMR will not be valued.***

PART – A

1 a. Choose your answers for the following :

i) The n^{th} derivative of $\cos^2 x$ is

A) $2^{n-1}\cos\left(2x+\frac{n\pi}{2}\right)$ B) $2^n\cos\left(2x+\frac{n\pi}{2}\right)$ C) $2^{n-1}\cos(2x+n\pi)$ D) $2^{n-1}\cos\left(\frac{n\pi}{2}\right)$

ii) The value of C of the Cauchy mean value theorem for $f(x) = e^x$ and $g(x) = e^{-x}$ in [4, 5] is

A) $\frac{5}{2}$ B) $\frac{3}{2}$ C) $\frac{9}{2}$ D) $\frac{1}{2}$

iii) Find the n^{th} derivative of $y = x^{n-1}\log x$ is

A) $y_n = \frac{(n+1)!}{x}$ B) $y_n = \frac{n!}{x}$ C) $y_n = \frac{(n-1)!}{x}$ D) $y_n = \frac{n!}{x^2}$

iv) Maclaurin's series expansion of log (1 + x) is

A) $x+\frac{x^2}{2}+\frac{x^3}{5}+\ldots\ldots$ B) $x-\frac{x^2}{3}+\frac{x^4}{5}-\ldots\ldots$

C) $x-\frac{x^2}{2}+\frac{x^3}{3}-\frac{x^4}{5}+\ldots\ldots$ D) $x+\frac{x^2}{3}+\frac{x^3}{16}+\ldots\ldots$ **(04 Marks)**

b. By informing in two different ways the nth derivative of x^{2n}, prove that

$$1+\frac{n^2}{1^2}+\frac{n^2(n-1)^2}{1^2\times 2^2}+\frac{n^2(n-1)^2(n-2)^2}{1^2\times 2^2\times 3^2}+\ldots\ldots\ldots=\frac{(2n)!}{(n!)^2}$$ **(06 Marks)**

c. Verify Rolle's theorem for the function $f(x)=\frac{\sin 2x}{e^{2x}}$ in $\left[0,\frac{\pi}{2}\right]$. **(04 Marks)**

d. Using Maclaurin's series, expand log sec x upto the term containing x^6. **(06 Marks)**

2 a. Choose your answers for the following :

i) The value of $\lim_{x\to\infty}\frac{\log x}{x}$ is

A) 0 B) 1 C) 2 D) –2

ii) If s is the arc length of the curve x = f(y) then $\frac{ds}{dy}$ is

A) $\sqrt{1+y_1^2}$ B) $\sqrt{1+y_1}$ C) $\sqrt{1+\left(\frac{dx}{dy}\right)^2}$ D) $\sqrt{\left(\frac{dy}{dx}\right)^2+\left(\frac{dx}{dy}\right)^2}$

iii) Pedal equation to the curve $\frac{2a}{r}=1-\cos\theta$ is

A) $P = ar^2$ B) $P^2 = a^2r$ C) $P^2 = a^2r^2$ D) $P^2 = ar$

iv) The angle between two curves $r = ae^{\theta}$ and $re^{\theta} = b$ is

A) $\frac{\pi}{2}$ B) $\frac{\pi}{4}$ C) 0 D) π **(04 Marks)**

2 b. For the curve $y = \frac{ax}{a+x}$, if ρ is the radius of curvature at any point (x, y), show that:

$$\left(\frac{2\rho}{a}\right)^{2/3} = \left(\frac{y}{x}\right)^2 + \left(\frac{x}{y}\right)^2$$ **(06 Marks)**

c. Evaluate $\lim_{x \to 0}\left(\frac{\sin x}{x}\right)^{1/x^2}$. **(04 Marks)**

d. Find the angle between the curves $r = \frac{a}{1+\cos\theta}$; $r = \frac{b}{1-\cos\theta}$. **(06 Marks)**

3 a. Choose your answers for the following :

i) When $u = y^2 \log\left(\frac{x}{y}\right)$ then $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y}$ is

A) u B) u^2 C) 2u D) 3u

ii) The Taylor's series of f(x, y) = xy at (1, 1) is

A) $1+[(x-1)+(y-1)]$ B) $1+[(x-1)+(y-1)]+[(x-1)(y-1)]$

C) $[(x-1)(y-1)]$ D) None of these

iii) The Jacobian of transformation from the Cartesian to polar coordinates system is

A) r^3 B) r C) r^2 D) r sin θ

iv) The rectangular solid of maximum volume which can be inscribed in a sphere is

A) parallelogram B) rectangle C) cube D) triangle. **(04 Marks)**

b. Examine the function $\sin x + \sin y + \sin(x+y)$ for extreme values. **(06 Marks)**

c. Find the possible error in percent in computing the parallel resistance 'r' of two resistances r_1 and r_2 from the formula $\frac{1}{r} = \frac{1}{r_1} + \frac{1}{r_2}$ are both in error by 2%. **(04 Marks)**

d. If $z(x+y) = x^2 + y^2$ show that $\left[\frac{\partial z}{\partial x} - \frac{\partial z}{\partial y}\right]^2 = 4\left[1 - \frac{\partial z}{\partial x} - \frac{\partial z}{\partial y}\right]$. **(06 Marks)**

4 a. Choose your answers for the following :

i) A gradient of the scalar point function ϕ that is $\nabla\phi$ is

A) vector function B) scalar function C) zero D) ϕ

ii) The directional derivative of $f(x, y, z) = x^2yz + 4xz^2$ at the (1, –2, –1) in the direction PQ where P = (1, 2, –1), Q = (–1, 2, 3) is

A) $\frac{28}{\sqrt{5}}$ B) $\frac{30}{\sqrt{4}}$ C) $\frac{-28}{\sqrt{5}}$ D) $\frac{20}{\sqrt{6}}$

iii) If $\bar{R}$ is the position vector of any point P(x, y, z) then $\nabla \cdot \bar{R}$ is

A) 3 B) –3 C) 2 D) 0

iv) If $\bar{r} = x\hat{i} + y\hat{j} + z\hat{k}$ then Curl $\bar{r}$ = ...

A) 0 B) 1 C) –1 D) ∞ **(04 Marks)**

b. Find the constants a and b such that $\bar{F} = (axy + z^3)i + (3x^2 - z)j + (bxz^2 - y)k$ is irrotational and find scalar potential function ϕ such that $F = \nabla\phi$. **(06 Marks)**

c. Prove that $\nabla x\left[\frac{ax\bar{r}}{r^n}\right] = \frac{-\bar{a}}{r^3} + \frac{3(a.\bar{r})\bar{r}}{r^5}$. **(04 Marks)**

d. Prove that the cylindrical coordinates system is orthogonal. **(06 Marks)**

PART – B

5 a. Choose your answers for the following :

i) The value of $\int_0^1 x^2(1-x^2)^{3/2}dx$ is

A) $\frac{\pi}{23}$ B) $\frac{1}{32}$ C) $\frac{\pi}{32}$ D) $\frac{\pi}{16}$

ii) The tangent to the curve $y^2 = 4ax$ at origin is

A) y-axis B) x-axis
C) both x-axis and y-axis D) does not exist

iii) The value of $\int_0^{\pi} \sin^4\left(\frac{x}{2}\right)dx$ is

A) $\frac{3\pi}{18}$ B) $\frac{3\pi}{8}$ C) $\frac{3\pi}{16}$ D) $\frac{3\pi^2}{8}$

iv) The surface area of the sphere of radius 'a' is

A) $4\pi a^2$ B) $4\pi^2 a$ C) $4\pi a$ D) $2\pi a^2$ **(04 Marks)**

b. Obtain the reduction formula for $\int \sin^m x \cos^n x\, dx$. **(06 Marks)**

c. Evaluate $\int_0^{\pi} \frac{\tan^{-1}(ax)}{x(1+x^2)}dx$ using the method of differentiation under integral sign. **(04 Marks)**

d. Find the area of the loop of the curve $ay^2 = x^2(a-x)$. **(06 Marks)**

6 a. Choose your answers for the following :

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

A) $e^x + e^{-y} = c$ B) $e^{-x} + e^{-y} = c$ C) $e^x + e^y = c$ D) $e^{x+y} = c$

ii) If the homogeneous differential equation $\frac{dy}{dx} = \frac{f_1(x,y)}{f_2(x,y)}$ the degree of the homogeneous functions $f_1(x, y)$ and $f_2(x, y)$ are

A) different B) same
C) relatively prime D) degree of $f_1(x, y)$ > degree of $f_2(x, y)$

iii) The integrating factor of the differential equation $(1+x^2)\frac{dy}{dx} + xy = \sin h^{-1}x$ is

A) $\frac{1}{\sqrt{1+x^2}}$ B) $\sqrt{1-x^2}$ C) $\sqrt{1+x^2}$ D) $\frac{x}{\sqrt{1+x^2}}$

iv) If replacing $\frac{dy}{dx}$ by $-\frac{dx}{dy}$ in the differential equation $f\left(x, y, \frac{dy}{dx}\right) = 0$ we get the differential equation of

A) polar trajectory B) orthogonal trajectory
C) parametric trajectory D) parallel trajectory **(04 Marks)**

b. Solve $(1+xy^2)\frac{dy}{dx} = 1$. **(06 Marks)**

c. Solve $\frac{dy}{dx} = \frac{x(2\log x + 1)}{\sin y + y\cos y}$. **(04 Marks)**

d. Find the orthogonal trajectory of $r^n = a^n \sin n\theta$ **(06 Marks)**

7 a. Choose your answers for the following :

i) In a system of linear equations if the rank of the co-efficient matrix = rank of the augmented matrix = n number of unknowns then the system has

A) no solutions B) unique solutions

C) infinite number of solutions D) trivial solutions

ii) The rank of matrix $\begin{bmatrix} 2 & -1 & 3 & 1 \\ 1 & 4 & -2 & 1 \\ 5 & 2 & 4 & 3 \end{bmatrix}$ is

A) 3 B) 4 C) 2 D) 5

iii) A square matrix in which aij = aji for all i and j then it is called a

A) unique matrix B) symmetric matrix C) skew symmetric D) triangular matrix

iv) The inverse of the square matrix A is

A) $|A|$ B) $\frac{\text{adj } A}{|A|}$ C) adj A D) $\frac{|A|}{\text{adj } A}$ **(04 Marks)**

b. Investigate for what value of λ and μ the simultaneous equation $x+y+z=6$, $x+2y+3z=10$, $x+2y+\lambda z=\mu$ have

i) no solutions ii) unique solutions iii) infinite number of solutions. **(06 Marks)**

c. Apply Gauss-elimination method to solve the following equations:

$2x-y+3z=1$, $-3x+4y-5z=0$, $x+3y-6z=0$ **(04 Marks)**

d. Find the rank of $\begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}$. **(06 Marks)**

8 a. Choose your answers for the following :

i) The eigen values of the matrix $\begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$ are

A) 2, 3, 8 B) 2, 2, 8 C) 8, 4, 3 D) 2, –2, 8

ii) A homogeneous expression of the second degree in any number of variables is called a

A) quadratic form B) diagonal form C) symmetric form D) spectral form

iii) A square matrix A of order 3 has 3 linearly independent eigen vectors then a matrix P can be found such that $P^{-1}AP$ is a

A) diagonal matrix B) symmetric matrix C) unit matrix D) singular matrix

iv) If the eigen vector is (1, 1, 1) then its normalized form is

A) $\left(\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}\right)$ B) $\left(\frac{1}{\sqrt{2}}, 0, -\frac{1}{\sqrt{2}}\right)$

C) $\left(-\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{2}}, -\frac{1}{\sqrt{2}}\right)$ D) $\left(-\frac{1}{\sqrt{3}}, -\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}\right)$ **(04 Marks)**

b. Reduce $6x^2+3y^2-4xy-2yz+4zx$ into canonical form. **(06 Marks)**

c. Find all the eigen values for the matrix, $A=\begin{bmatrix} 7 & -2 & 0 \\ -2 & 6 & -2 \\ 0 & -2 & 5 \end{bmatrix}$. **(04 Marks)**

d. Reduce the matrix, $A=\begin{bmatrix} 11 & -4 & 7 \\ 7 & -2 & -5 \\ 10 & -4 & -6 \end{bmatrix}$ into a diagonal matrix. **(06 Marks)**

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10PHY12/22

First/Second Semester B.E. Degree Examination, June 2012
Engineering Physics

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer any FIVE full questions, choosing at least two from each part.***
2. ***Answer all objective type questions only on OMR sheet page 5 of the answer booklet.***
3. ***Answer to objective type questions on sheets other than OMR will not be valued.***
4. ***Constants to be given, mass of electron $= 9.11 \times 10^{-31}$kg, $e = 1.6 \times 10^{-19}$C, $c = 3 \times 10^{8}$m/s, $h = 6.626 \times 10^{-34}$JS, $k = 1.38 \times 10^{-23}$ J/k, $t_o = 8.854 \times 10^{-12}$ F/m, $N_A = 6.022 \times 10^{26}$/K mole.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – A

1 a. Choose your answers for the following : **(04 Marks)**

i) Ultraviolet catastrophe is the failure of Rayleigh-Jeans law in explaining the black-body radiation for wavelength.
A) equal to that in visible range B) longer than that of violet light
C) shorter than that of violet light D) None of these

ii) Photo-electric effect establishes
A) wave nature of light B) particle nature of light
C) dual nature of light D) None of these

iii) If the group velocity of the de-Broglie waves associated with a particle is 3×10^4 m/s, the velocity of the particle is
A) 3×10^8 m/s B) 3×10^{12} m/s C) 3×10^4 m/s D) None of these

iv) The Compton wavelength is given by
A) h/m_oc^2 B) h^2/m_oc^2 C) h/m_oc D) $h^2/2m_oc$

b. State de-Broglie hypothesis. Using the de-Broglie wavelength expression, show that an electron accelerated by a potential difference V volt is $\lambda = 1.226 \times 10^{-9}/\sqrt{v}$. **(05 Marks)**

c. Define group velocity and obtain expression for the same. **(06 Marks)**

d. Find the de-Broglie wavelength of an electron accelerated through a potential difference of 182 volts and object of mass 1 kg moving with a speed of (1 m/s) compare the results and comment. **(05 Marks)**

2 a. Choose your answers for the following : **(04 Marks)**

i) If the uncertainity in momentum is large, the uncertainity in wavelength is
A) Small B) Large C) Zero D) None of these

ii) If the wave packet is narrow then there is
A) Large uncertainity in momentum B) Small uncertainity in momentum
C) No uncertainity in momentum D) None of these

iii) An electron, a proton and an α-particle are enclosed in three one dimensional boxes of the same width. The energy levels will be closer together for
A) Electron B) Proton C) Alpha particle D) None of these

iv) If the electron moves in one-dimensional box of length 2nm, the normalization constant is
A) $1(nm)^{-1/2}$ B) $2(nm)^{-1}$ C) $\left[\sqrt{2}nm\right]^{-1}$ D) None of these

b. State Heisenberg's uncertainity principle. Using uncertainity principle explain the non-existence of electron in the nucleus. **(07 Marks)**

c. Set up time independent Schrodinger wave equation for free particle in one-dimension using complex variables. Write the expression for zero point energy. **(05 Marks)**

d. A particle moving in one-dimension box is described by the wave function

$\psi = x\left[\sqrt{3}\right]$ for $0 < x < 1$

$\psi = 0$ elsewhere and

Find the probability of finding the particle within the interval $\left(0, \frac{1}{2}\right)$. **(04 Marks)**

3 a. Choose your answers for the following : **(04 Marks)**

i) In classical free electron theory, the electric field due to ion cores.
A) is neglected B) is assumed to be periodic
C) is assumed to be constant D) None of these

ii) Mobility of electron is
A) reciprocal of electrical conductivity
B) acceleration of electron per unit ele. field
C) average drift velocity per unit electric field
D) None of these

iii) If E_F is the Fermi energy at absolute zero, then mean energy of the electron at absolute zero is

A) $\bar{E} = 1.5\, E_F$ B) $\bar{E} = \frac{2}{3} E_F$ C) $\bar{E} = \frac{2}{5} E_F$ D) $\bar{E} = \frac{3}{5} E_F$

iv) The resistivity of metals is due to scattering of electron by
A) phonons B) lattice imperfection
C) impurities D) All of these

b. Explain the terms
i) Relaxation time; ii) Mean collision time; iii) Drift velocity **(06 Marks)**

c. Define Fermi energy. Discuss the Fermi factor $f(\sigma)$ for cases $E < E_F$, $E > E_F$ at $T = 0$, $E = E_F$ at $T \neq 0$. **(05 Marks)**

d. Calculate the conductivity of sodium given $\tau_m = 2 \times 10^{-14}$S. Density of sodium is 971 kg/mt^3. its atomic weight is 23 and has one conduction electron/atom. **(05 Marks)**

4 a. Choose your answers for the following : **(04 Marks)**

i) The electric dipole moment per unit volume is
A) Magnetization B) Dipole moment
C) Electric polarization D) Electric susceptibility.

ii) The comparatively, high value of t_r for water suggests that it is
A) Semi conductor B) Conductor
C) Di-electric D) Superconductor

iii) All materials have
A) Diamagnetic property B) Ferrimagnetic property
C) Ferromegnetic property D) Paramagnetic property

iv) In ionic solid dielectric as the temperature increases the ionic polarization
A) Increases B) decreases
C) remain constant D) None of these

b. Derive Clausius-Mossotti equation. **(05 Marks)**

c. Describe any three polarization mechanisms with example. **(06 Marks)**

d. An elemental solid containing 2×10^{28} atoms/mt^3 shows an electronic polarizability of 2×10^{-40} Fmt^2. Assuming a Lorentz force field to be operative, calculate the di-electric constant of the material. **(05 Marks)**

PART – B

5 a. Choose your answers for the following : **(04 Marks)**

i) Spontaneous emission of light produces
   A) coherent light B) incoherent light
   C) unidirectional light D) None of these

ii) The He-Ne laser is a
   A) high power continuous laser B) high power pulsed laser
   C) low power continuous laser D) low power pulsed laser

iii) The life time of an atom in a metastable state is of the order of
   A) a few seconds B) unlimited time
   C) a nanosecond D) few milliseconds.

iv) From a broken hologram which is 10% of the original, if reconstruction of image is being done, then
   A) only 10% of information of the object can be obtained.
   B) complete information of the object is obtained.
   C) no information of the object can be obtained.
   D) None of these

b. Explain the terms
   i) Resonant cavity; ii) Metastable state; iii) Stimulated emission. **(06 Marks)**

c. Describe the construction and working of He-Ne laser with the help of energy level diagram. **(06 Marks)**

d. The ratio of population of two energy levels is 1.059×10^{-30}. Find the wavelength of light emitted at 330K. **(04 Marks)**

6 a. Choose your answers for the following : **(04 Marks)**

i) In a superconductor in superconducting state critical magnetic field
   A) increases if temperature decreases B) increase with increase in temperature
   C) does not depend on temperature D) remain content

ii) If the optical fibre is kept in a medium of $\mu > 1$ instead of air, the acceptance angle
   A) increases B) decreases
   C) remains same D) None of these

iii) Attenuation in optic fibre is due to
   A) absorption B) scattering
   C) radiation loss D) all the above

iv) Numerical aperture of an optical fibre depends on
   A) acceptance angle B) η of cladding
   C) η_{core} of material D) All of these

b. Discuss the different types of optical fibres with suitable diagrams. **(06 Marks)**

c. Write a short note on Masslex vehicles. **(05 Marks)**

d. Calculate the N.A., V-number and number of modes in an optical fibre of core diameter 50μm, core and cladding refractive indices 1.41 and 1.4 at wavelength 820 nm. **(05 Marks)**

7 a. Choose your answers for the following : **(04 Marks)**

i) A crystal of tetragonal lattice has

A) $a = b = c$ B) $a \neq b \neq c$ C) $a = b \neq c$ D) $a \neq b = c$

ii) The relation between atomic radius r and lattice constant a in FCC structure is

A) $a = 2R$ B) $a = 2\sqrt{2}\,R$ C) $a = \frac{\sqrt{3}}{4}R$ D) $a = \frac{4}{\sqrt{3}}R$

iii) Packing factor of diamond crystal is

A) 34% B) 52% C) 68% D) 74%

iv) Which of the following unit cells is a primitive cell?

A) Simple cubic B) bcc C) FCC D) None of these

b. Derive an expression for interplanar spacing in a cubic system. **(05 Marks)**

c. Explain how Bragg's spectrometer is used for determination of interplanar spacing in a crystal. **(06 Marks)**

d. Calculate the energy of electron that produces Bragg's diffraction of first order at glancing angle of 22° when incident on crystal with interplanar spacing of 1.8 A°. **(05 Marks)**

8 a. Choose your answers for the following : **(04 Marks)**

i) The nanostructure reduced in only one direction is known as

A) quantum dot B) quantum wire

C) quantum well D) film

ii) Fullerene is a

A) molecule B) atom

C) chemical mixture D) nano particle

iii) Testing of a product without causing any damage is called

A) minute testing B) destructive testing

C) non-destructive testing D) random testing

iv) The signal due to a reflected wave is called

A) transmitted wave B) longitudinal wave

C) echo D) peaco

b. With simple illustration describe the two methods of preparation of nano materials. **(05 Marks)**

c. What are the potential applications of carbon nanotubes? **(05 Marks)**

d. Describe in brief a method of measuring velocity of ultrasonic waves in a liquid. **(06 Marks)**

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10CCP13/23

First/Second Semester B.E. Degree Examination, June 2012
Computer Concepts and 'C' Programming

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer any FIVE full questions, choosing at least two from each part.***
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2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – A

1 a. Choose your answers for the following : **(04 Marks)**

i) The first mechanical computer designed by Charles Babbage was called
A) Abacus B) Processor
C) Calculator D) Analytical Engine

ii) Integrated circuit was developed in _____ generation of computers
A) FIRST B) SECOND
C) THIRD D) FOURTH

iii) 1 Gigabyte (GB) is equivalent to _____
A) 1024 MB B) 1024 KB
C) 1024 GB D) 1024TB

iv) ASCII is a _____ bit BCD code
A) 4 B) 6
C) 8 D) 10

b. Discuss the basic structure of a computer with a neat block diagram. **(06 Marks)**

c. Explain different types of computers for organizations. **(10 Marks)**

2 a. Choose your answers for the following : **(04 Marks)**

i) A collection of 4 bits is called
A) Nibble B) Byte C) Word D) Record

ii) Which of the operating system is not a GUI based?
A) WINDOWS B) LINUX C) MAC D) DOS

iii) Which is a secondary memory device?
A) Cache B) RAM C) Registers D) Floppy disk

iv) Which of the following is not a layer in the OSI model?
A) Presentation B) Transport C) Session D) Communication

b. Enlist various secondary storage devices. Explain how data can be stored and retrieved from CD-ROM. **(06 Marks)**

c. What is an operating system? What are the major functions of an operating system? **(06 Marks)**

d. Write a note on the need for networking. **(04 Marks)**

3 a. Choose your answers for the following : **(04 Marks)**

i) 'C' language is a _____

A) Structured language B) Object-oriented language
C) Machine language D) Assembly language

ii) Identify valid identifier

A) a123 B) $123
C) 123a D) a#123

iii) A step by step procedure to solve a given problem is called

A) Logarithm B) Algorithm
C) Flowchart D) Program

iv) The range of char data types on 16 bit machines is:

A) -126 to 127 B) -128 to 127
C) -127 to 128 D) -127 to 127

b. Explain the different phases of solving a given problem using computer. **(10 Marks)**

c. Write an algorithm and flowchart to calculate factorial of a number. **(06 Marks)**

4 a. Choose your answers for the following : **(04 Marks)**

i) The operator % yields

A) Quotient B) Remainder
C) Percentage D) Fractional part

ii) Evaluate the expression 10! = 10 || 5 < 4&&8. The result is:

A) 1 B) 0 C) 2 D) 10

iii) Which of the following bitwise operator shifts their first operand to its left?

A) && B) << C) >> D) ^

iv) If a = 10, b = 5 find C = ++a-b. The result is:

A) 5 B) 7 C) 6 D) -6

b. Explain precedence and associativity of operators in 'C' with an example. **(08 Marks)**

c. What is type conversion? What are the different ways of type conversion? Explain with an example. **(08 Marks)**

PART – B

5 a. Choose your answers for the following : **(04 Marks)**

i) What is the output of following program?

```
#include <stdio.h>
Void main( )
{ int num;
  for(num = 0; num <= 10; num ++)
     { ;
     }
   printf("%d", num);
}
```

A) 012345678910 B) 11
C) 10 D) 01234567891011

ii) A for loop with no test condition is known as _____ loop

A) Finite B) Infinite C) While D) do-while

iii) In 'C' which of the following is not a storage class specifier?

A) Static B) Auto C) Const D) Register

iv) Which of the following is the last character that is stored in a char array in 'C'?

A) \0 B) \NULL C) 0 D) /0

b. Describe the different ways of passing parameters to functions. **(08 Marks)**

c. Write a 'C' program using functions, to compute the sum of N numbers. **(08 Marks)**

6 a. Choose your answers for the following : **(04 Marks)**

i) Which of the following command will place the program control out of the loop when it gets executed

A) goto B) Break C) exit D) continue

ii) How many times the following loop will be executed?

```
for(; ;)
{
   printf("Hello");
}
```

A) 1 B) 0 C) Infinite D) Finite

iii) What would be the output of the following code segment?

```
for(i = 1; i< = 5; i++)
{
    if(i = = 3) continue;
    printf("%d", i);
}
```

A) 12 B) 1245 C) 1234 D) 345

iv) The minimum number of times the do-while loop will be executed

A) 0 B) 1 C) 2 D) Both a and b

b. Differentiate between while and do while statements, with an example for each. **(08 Marks)**

c. Write a 'C' program to calculate area of circle, rectangle and triangle using switch statement. Area of circle = π * r * r, Area of rectangle = length × breadth, Area of triangle = 0.5 * base * height. **(08 Marks)**

7 a. Choose your answers for the following : **(04 Marks)**

i) In the following segment of code, what will be the values of x and y after execution, if n assumes a value of zero(0)

```
x = 1; y = 1;
if (n > 0)
{ x = x + 1;
  y = y – 1;
}
printf("%d %d", x, y);
```

A) 0, 0 B) 1, 0 C) 0, 1 D) 1, 1

ii) Arrays can be initialized at

A) Compile time B) Run time C) Both A and B D) None of these

iii) Strncmp( ) function has _____ number of parameters

A) 2 B) 3 C) 1 D) 4

iv) How many times the following while loop is executed?

```
While (0)
{
   Statements;
}
```

A) 0 B) 1 C) Infinite D) Finite

b. What is an array? Write a program to print the sum of two one dimensional array and store the result in another array. **(08 Marks)**

c. Write a program that accepts a string and check whether the string is palindrome or not. **(08 Marks)**

8 a. Choose your answers for the following : **(04 Marks)**

i) Parallel computing is _____ execution of instructions in a computer

A) Simultaneous B) Serial
C) Accurate D) Complete

ii) Open MP supports _____

A) Multi-threaded B) Shared memory
C) Both a and b D) None of these

iii) Which of the following is not a synchronization construct?

A) Single B) Master
C) Section D) Critical

iv) Which of the following is the correct syntax of specifying open MP threads in C?

A) #pragma omp directive [clause 1] [clause 2]… [clause n]
B) #pragma openmpdirective [clause 1] [clause 2]…[clause n]
C) #define omp directive [clause 1]…[clause n] accurate
D) #define pragma omp directive [clause 1]…[clause n]

b. What is parallel computing? What are the various motivating factors for parallelism? **(10 Marks)**

c. What is open MP? Explain the open MP programming model. **(06 Marks)**

* * * * *

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10CIV13/23

First/Second Semester B.E. Degree Examination, June 2012
Elements of Civil Engineering and Engineering Mechanics

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer FIVE full questions choosing at least two from each part.***
2. ***Answer all objective type questions only on OMR sheet page 5 of the answer booklet.***
3. ***Answer to objective type questions on sheets other than OMR will not be valued.***

PART – A

1. a. Select the correct answer : **(04 Marks)**

i) A Bascule bridge is a
A) Floating bridge B) Arch bridge
C) Suspension bridge D) Movable bridge

ii) Geotechnical engineering involves the study of
A) Water B) Soil C) Air D) All of these

iii) Pick up a structure in which an inspection gallery is formed
A) Dam B) Bridge C) Harbour D) Airport

iv) The part of civil engineering which deals with waste water and solid waste is called
A) Transportation Engineering B) Structural Engineering
C) Sanitary Engineering D) Surveying

b. Explain the role of civil engineer in the infra – structural development of a nation. **(06 Marks)**

c. Explain different types of roads. **(06 Marks)**

d. Give the difference between Earthen dam and gravity dam. **(04 Marks)**

2. a. Select the correct answer : **(04 Marks)**

i) The moment of a force about a moment centre is a measure of its
A) Translatory effect B) Rotational effect
C) Both A and B D) None of these

ii) Effect of force on a body depends on
A) Magnitude B) Direction C) Position D) All of these

iii) Couple means two forces acting parallel and
A) Equal in magnitude and in same direction
B) Not equal in magnitude but in same direction
C) Equal in magnitude but opposite in direction
D) None of these

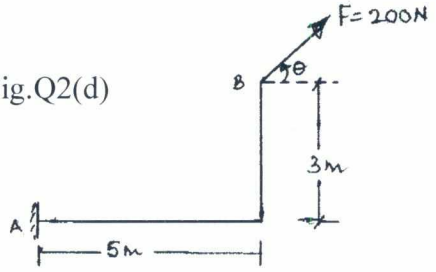
iv) The magnitude of the moment is _____ when a force is applied perpendicular to a lever
A) Maximum B) Minimum C) Zero D) Negative

b. State and explain principle of transmissibility of a force. **(04 Marks)**

c. Explain equivalent force – couple system. **(04 Marks)**

d. Determine angle θ ($0 \leq \theta \leq 180^0$) for the force F = 200N shown in fig.Q2(d), so that it produces (a) maximum moment about 'A' and (b) minimum moment about 'A'. Determine maximum and minimum moments. **(08 Marks)**

Fig.Q2(d)



3. a. Select the correct answer : **(04 Marks)**

i) The process of finding the resultant of a system of forces is called

A) Resultant B) Resolution C) Composition D) None of these

ii) If two forces P and Q (P > Q) act on the same straight line but in opposite direction their resultant is

A) P + Q B) $\frac{P}{Q}$ C) Q - P D) P – Q

iii) Component of a force at a right angles to its line of action is

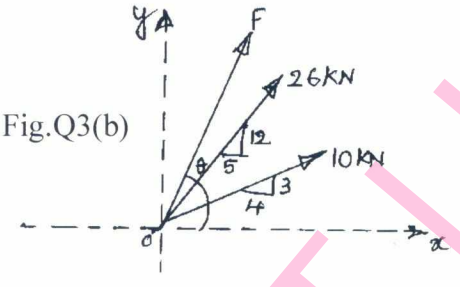
A) Zero B) Positive C) Negative D) None of these

iv) In a coplanar concurrent force system if $\Sigma H = 0$, then the resultant is

A) Horizontal B) Vertical C) Moment D) None of these

b. The 26kN force is the resultant of two forces, one of which is shown in fig.Q3(b). Determine the other force. **(08 Marks)**

Fig.Q3(b)



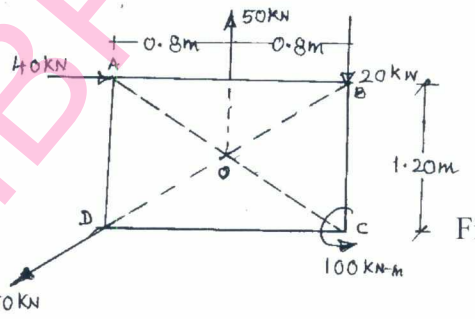


Fig.Q3(c)

c. A rigid plate is subjected to the forces as shown in fig.Q3(c), compute resultant of forces and position of resultant force with respect to centroid point '0' of the plate. **(08 Marks)**

4. a. Select the correct answer : **(04 Marks)**

i) Centroid of semicircle of radius 'R' about its centroidal axis parallel to diametric axis is

A) $\frac{3R}{4\pi}$ B) $\frac{3R}{8\pi}$ C) $\frac{4R}{\pi}$ D) $\frac{4R}{3\pi}$

ii) An axis over which one half of plane figure is just mirror image of the other half is

A) Axis of symmetry B) Unsymmetrical axis

C) Bottom most axis D) None of these

iii) Moment of total area about its centroidal axis is

A) Twice the area B) Three times the area

C) Zero C) None of these

iv) The centroid of a triangular lamina of height 'h' is situated at a distance ____ from its apex.

A) $\frac{h}{3}$ B) $\frac{2h}{3}$ C) $\frac{h}{2}$ D) $\frac{h}{4}$

b. Locate the centroid of the shaded area shown in fig.Q4(b), with respect to point '0'. **(08 Marks)**

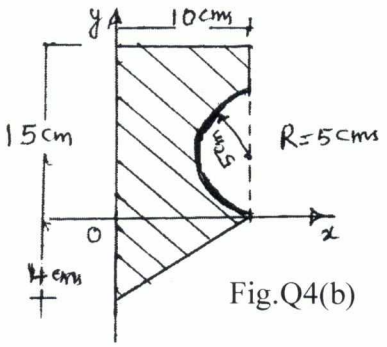


Fig.Q4(b)

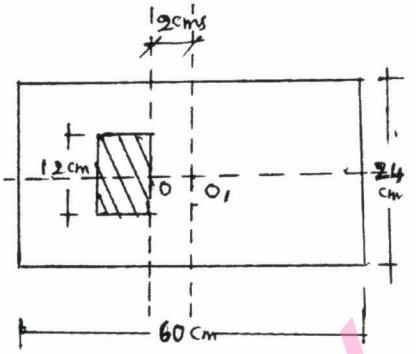


Fig.Q4(c)

c. The centroid of the rectangular area requires to be shifted from point '0' to 01 (2 cms). This is accomplished by removing hatch portion which is 12cm deep and symmetrical about X X-axis. Determine area of hatched portion shown in fig.Q4(c). **(08 Marks)**

PART - B

5. a. Select the correct answer : **(04 Marks)**

i) The force which is equal and opposite to resultant is
A) Resultant force B) Moment
C) Equilibrant D) None of these

ii) A particle acted upon by the two forces of equal magnitude is in equilibrium. The angle between the forces is
A) 0^0 B) 90^0 C) 180^0 D) 45^0

iii) The necessary condition of equilibrium of a coplanar concurrent force system is algebraic sum of _____ must be zero.
A) Horizontal and Vertical forces B) Moment of forces
C) Horizontal vertical and moment of forces
D) None of these

iv) Lami's equation can be applied when number of unknown forces are ____
A) TWO B) Five C) Four D) Three

b. Determine the angle θ for the system of strings ABCD in equilibrium as shown in fig.Q5(b). **(08 Marks)**

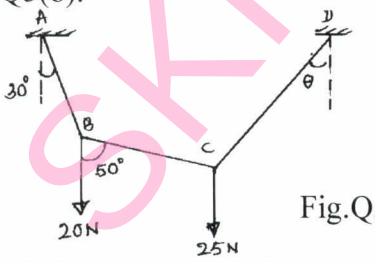


Fig.Q5(b)

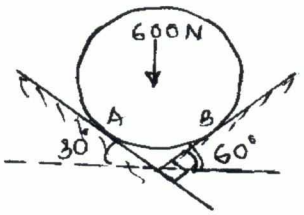


Fig.Q5(c)

c. A cylinder of weight 600N rests on smooth surfaces as shown in fig. Q5(c). Determine the reactions at contact points. The contact surfaces are perpendicular to each other. **(08 Marks)**

6. a. Select the correct answer : **(04 Marks)**

i) A cantilever beam is one in which _____
A) Both ends are fixed B) Both ends are hinged
C) One end is fixed and other end is simply supported
D) One end is fixed and other end is free.

ii) A truss is perfect when
A) $m = 2j - 3$ B) $2j = m + 3$ C) $m = 3j - 2$ D) $2j = m - 3$

iii) The minimum number of members to form a perfect truss is
A) 1 B) 2 C) 3 D) 4

iv) The number of reaction components at an hinged end of a beam
A) zero B) 2 C) 3 D) 1

b. A pin joined truss is loaded and supported as shown infig.Q6(b). Determine forces in members BC, GF and CG and nature of forces. Use method of section. **(08 Marks)**

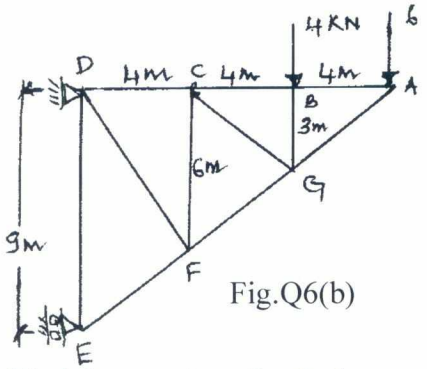


Fig.Q6(b)

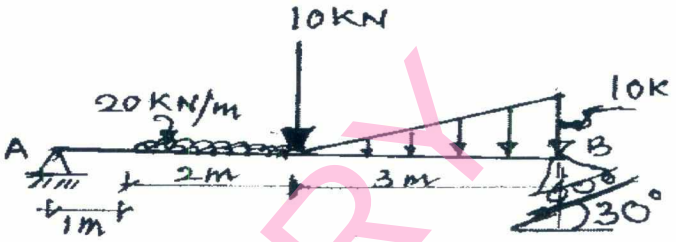


Fig.Q6(c)

c. Find the reactions for the beam supported and loaded as shown in fig.Q6(c). **(08 Marks)**

7. a. Select the correct answer : **(04 Marks)**

i) Compared to static friction, kinetic friction is
A) greater B) smaller C) very large D) zero

ii) Frictional force acts _____ to the surfaces in contact
A) Tangential B) Normal C) Inclined D) None of these

iii) The force of friction depends on
A) Area of contact B) Roughness of surfaces
C) Both area of contact and roughness of surfaces
D) None of these

iv) At the point of impending motion, the static frictional force is
A) Zero B) Maximum C) Minimum D) Infinite

b. State laws of static friction. **(04 Marks)**

c. Briefly explain i) Angle of repose ii) Cone of friction. **(04 Marks)**

d. A ladder 7m long weighing 300N is resting against a wall at an angle of 60^0 to the horizontal ground. A man weighing 700N climbs the ladder, at what position does he induce slipping. Take $\mu = 0.25$ for all contact surfaces. **(08 Marks)**

8. a. Select the correct answer : **(04 Marks)**

i) Moment of inertia of a square of side 'b' about an axis through its centroid is
A) $\frac{b^4}{12}$ B) $\frac{b^4}{8}$ C) $\frac{b^4}{36}$ D) $\frac{b^3}{12}$

ii) Moment of inertia of a triangle of base 'b' and height 'h' about its base is
A) $\frac{bh^3}{36}$ B) $\frac{bh^4}{36}$ C) $\frac{hb^3}{12}$ D) $\frac{Bh^3}{12}$

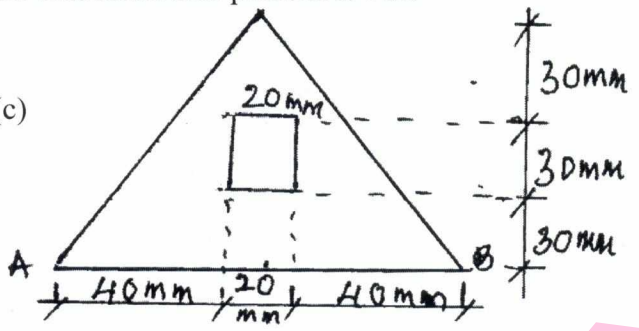
iii) The unit of radius of gyration is
A) mm B) mm^2 C) KN - m D) mm^4

iv) Which of the following equation relating to radii of gyration is correct?
A) $K_{zz} = K_{xx} + K_{yy}$ B) $K_{xx} = K_{yy} + K_{zz}$
C) $K_{zz}^2 = K_{xx}^2 + K_{yy}^2$ D) None of these

b. State and prove parallel axis theorem. **(06 Marks)**

c. Determine moment of inertia and radius of gyration of the area shown in fig.Q8(c), about base AB and centroidal axis parallel to AB. **(10 Marks)**

Fig.Q8(c)



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10EME14/24

First/Second Semester B.E. Degree Examination, June 2012
Elements of Mechanical Engineering

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer any FIVE full questions, choosing at least two from each part.***
2. ***Answer all objective type questions only on OMR sheet page 5 of the answer booklet.***
3. ***Answer to objective type questions on sheets other than OMR will not be valued.***

PART – A

1 a. Choose your answers for the following : **(04 Marks)**

i) The condition of steam in boiler drum is always
A) Dry B) Wet
C) Saturated D) Superheated

ii) In which case, the potential energy is converted into the mechanical energy
A) Hydel energy B) Solar energy
C) Wind energy D) Nuclear energy

iii) Sensible heat is also called as
A) Enthalpy of saturated water B) Enthalpy of evaporation
C) enthalpy of dry saturated steam D) Enthalpy of super heated steam

iv) If x is the weight of dry steam and y is the weight of water suspension, then dryness fraction is equal to

A) $\frac{x}{x+y}$ B) $\frac{y}{x+y}$

C) $\frac{x}{x-y}$ D) $\frac{y}{x-y}$

b. Sketch and explain the working of Babcock and Wilcox boiler. **(10 Marks)**

c. Determine the specific volume and density of 1 kg steam at a pressure of 7×10^5 Pa, when the condition of steam is i) Wet, having dryness fraction 0.9 ii) Dry iii) Superheated at 250°C. If required use the extract of the steam table provided below :

P	t_s	V_g
7 bar	437.92 K	0.27334 m^3/kg

(06 Marks)

2 a. Choose your answers for the following : **(04 Marks)**

i) The propelling force in a steam turbine depends on the _____ action of the turbine
A) Dynamic B) Static
C) Both D) None

ii) France turbine is a _____ turbine
A) Impulse B) Reaction
C) Both D) None

iii) An example for tangential flow turbine is
A) Pelton wheel B) Kaplan Turbine
C) Thomson turbine D) Modern Francis Turbine

iv) Delaval turbine is also called
A) Impulse steam turbine B) Gas turbine
C) Reaction turbine D) Water turbine

b. What is compounding? With a suitable diagram, explain the velocity compounding. **(10 Marks)**

c. Distinguish between impulse and reaction turbine. **(06 Marks)**

3 a. Choose your answers for the following : **(04 Marks)**

i) In IC engines, the connecting rod connects _____ and _____
A) Piston and crank shaft B) Inlet and outlet valves
C) Piston and piston rings D) None

ii) The combustion of fuel in petrol engine takes place at
A) Constant pressure B) Constant volume
C) Constant temperature D) None of these

iii) The process of breaking up of a liquid into fine droplets by spraying is called
A) Vaporisation B) Carburetion
C) Ionization D) Atomisation

iv) A diesel engine is
A) Spark ignition engine B) Compression ignition engine
C) External combustion engine D) none of these

b. With the help of line diagram, explain the working of a four stroke petrol engine. **(08 Marks)**

c. The following observations were recorded during a test on 4-stoke diesel engine :
Bore = 200 mm, Stroke = 250 mm, Mean effective pressure = 0.6 MPa,
Brake drum diameter = 1.2 m. Net brake load = 500 N, Speed of crank shaft = 600 rpm.
Find : i) Indicated power ii) Brake power
iii) Friction power iv) Mechanical efficiency. **(08 Marks)**

4 a. Choose your answers for the following : **(04 Marks)**

i) In _____ of the refrigerator, liquid refrigerant is evaporated by absorption of heat from the refrigerator cabinet in which substances are kept that have to be cooled
A) Compressor B) Condenser
C) Evaporator D) Expansion value

ii) Throttle value is used in a refrigerator to _____
A) Compress refrigerant B) Expand the refrigerant
C) Absorb the heat from the refrigerant D) Condense the refrigerant

iii) In SI unit one ton of refrigeration is equal to
A) 210 kJ/ min B) 21 kJ/ min
C) 420 kJ/ min D) 105 kJ/ min

iv) A refrigerant should have
A) Low viscosity B) Low freezing point
C) Low boiling point D) All the above

b. What is the principle of refrigeration? Name the essential parts of a refrigerator and briefly explain their functions. **(08 Marks)**

c. With a neat sketch, explain the working of room air conditioner. **(08 Marks)**

PART – B

5 a. Choose your answers for the following : **(04 Marks)**

i) The slowest speed in lathe is adopted for following operation
A) Turning B) Thread cutting
C) Taper turning D) Knurling

ii) _____ is the operation of Seperating a piece of finished work from the bar stock
A) Parting B) Boring
C) Facing D) Turning

iii) During machining operation on the lathe, the tools are placed on
A) Saddle B) Cross slide
C) Compound rest D) Tool post

iv) _____ is the process of generating internal threads
A) Reaming B) Boring
C) Tapping D) Drilling

b. Sketch a radial drilling machine and explain its working. **(08 Marks)**

c. With the help of a sketch, indicate the specifications of a lathe. **(08 Marks)**

6 a. Choose your answers for the following : **(04 Marks)**

i) The cutting tool in a milling machine is mounted on
A) Tool holder B) Arbor
C) Column D) Table

ii) Removal of material by mechanical action of abrasive particles is called as
A) Slot milling B) Grinding
C) Reaming D) Tapping

iii) In _____ grinding, the work piece is held over a work rest in between two grinding wheels.
A) Cylindrical centre B) Centreless cylindrical
C) Surface grinding D) None of these

iv) Chip thickness in _____ milling is minimum at the beginning of cut and reaches to the maximum when the cut ends.
A) Up B) Down
C) Both D) None

b. Sketch and explain centreless grinding. **(08 Marks)**

c. Draw the neat sketch of horizontal milling machine and explain parts. **(08 Marks)**

7 a. Choose your answers for the following : **(04 Marks)**

i) The hard filler material used in brazing is
A) Solder B) Flux
C) Spelter D) Electrode

ii) Solder is essentially a
A) Tin silver base B) tin lead base
C) Silver lead base D) bismuth lead base.

iii) Resistance of lubricating oil to flow is
A) Porosity B) Electricity
C) Viscosity D) None

iv) Support provided for rotating shaft is
A) Bearings B) Lubricant
C) Axle D) Pedestal

b. Explain briefly the metal joining processes of soldering, brazing and welding. **(09 Marks)**

c. Briefly discuss the three types of flames used in gas welding and mention their applications. **(07 Marks)**

8 a. Choose your answers for the following : **(04 Marks)**

i) _____ belts are acid and water proof
A) Leather B) Balata
C) Textile D) Canvas

ii) The ratio of pitch circle diameter to number of teeth is
A) Pitch B) Circular pitch
C) Module D) Addendum

iii) The surface of the gear tooth below the pitch surface is called
A) bottom tooth B) Face
C) Flank D) Tooth depth

iv) Mitre is a type of
A) Spur gear B) Helical gear
C) Bevel gear D) Worm gear

b. Derive an equation for ratio of tension in belt drive. **(08 Marks)**

c. Write the different types of gear trains with their application. **(08 Marks)**

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10ELN15/25

First/Second Semester B.E. Degree Examination, June 2012
Basic Electronics

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer any FIVE full questions, choosing at least two from each part.***
2. ***Answer all objective type questions only on OMR sheet page 5 of the answer booklet.***
3. ***Answer to objective type questions on sheets other than OMR will not be valued.***

PART – A

1 a. Choose your answers for the following : **(04 Marks)**

i) Zener diode can be used for rectification. This statement is_____.
A) True B) False
C) Niether True Nor False D) None of these

ii) PIV in case of half wave rectifier for an input signal of $V_m \sin wt$ is_____ .
A) V_m B) $2V_m$
C) $\frac{V_m}{2}$ D) $\frac{V_m}{\sqrt{2}}$

iii) If frequency of input is 60 Hz for a fullwave rectifier, the frequency of ripple is_____.
A) 30 Hz B) 60 Hz
C) 120 Hz D) 180 Hz

iv) If peak to peak voltage is 4 V then RMS voltage is _____ .
A) $\sqrt{2}$ Volts B) 2 Volts
C) 2.82 Volts D) Both (A) and (C).

b. Calculate the reverse saturation current for silicon diode which passes a current of 10 mA at 27°C, for a forward bias of 700 mV. **(04 Marks)**

c. Explain the effect of temperature on the diode characteristics and also on the power rating of the diode. **(06 Marks)**

d. Explain the operation of full wave center tap rectifier with neat circuit diagram and waveforms. **(06 Marks)**

2 a. Choose your answers for the following : **(04 Marks)**

i) Bipolar junction transistor is _____ controlled device.
A) Voltage B) Current
C) Power D) Temperature

ii) Operating point must be _____ for proper functioning of transistor.
A) Increasing B) Decreasing
C) Stable D) High

iii) The DC load line of a transistor is a _____ .
A) Curved line B) '-ve' slope line
C) '+' slope line D) Zero slope line

iv) In a transistor α and β are related by _____ .
A) $\alpha = \frac{1}{1-\beta}$ B) $\alpha = \frac{\beta}{1+\beta}$
C) $\beta = \frac{\alpha}{1+\alpha}$ D) $\frac{1}{1-\alpha}$

b. Explain the characteristics of common base transistor configuration with neat circuit diagram. **(08 Marks)**

2 c. What is a d.c. load line? Explain with a fixed bias circuit diagram. **(04 Marks)**

d. For the fixed bias circuit shown in Fig. Q2 (d), $V_{BE} = 0.7$ V, $\beta = 60$, find

i) Quiescent values of base and collector currents.
ii) Quiescent value of V_{CE}.
iii) Base-ground and collector-ground voltages.
iv) Base-collector voltage.

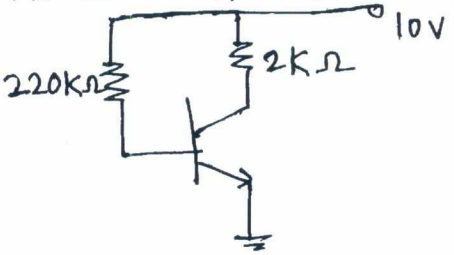

Fig. Q2 (d) **(04 Marks)**

3 a. Choose your answers for the following : **(04 Marks)**

i) In voltage divider bias circuit R_E is used for
A) Stabilization B) As a load
C) As a bypass element D) All of these

ii) For exact analysis of voltage divider bias circuit _____ theorem is used.
A) Nortons B) Thevenins
C) Superposition D) Any one of these

iii) _____ is the linear region of transistor characteristics.
A) Saturation B) Cutoff
C) Active D) Both (A) and (C)

iv) Stability factor of fixed bias circuit is,
A) β B) $\beta - 1$
C) $1 + \beta$ D) None of these

b. List the factors which affect the stability of operating point. **(04 Marks)**

c. With a neat circuit diagram, explain voltage divider biasing circuit and derive the expressions for V_{CE} and I_C using exact analysis. **(08 Marks)**

d. For the circuit shown in Fig. Q3 (d), using silicon transistor with $V_{BE} = 0.7$ V and $\beta = 80$, find V_{CE} and V_B. **(04 Marks)**

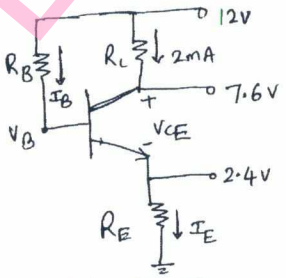

Fig. Q3 (d)

4 a. Choose your answers for the following : **(04 Marks)**

i) The device which has wide application in pulse generator is_____
A) FET B) BJT
C) Diode D) UJT

ii) FET is _____controlled device.
A) Current B) Voltage
C) Power D) Temperature

iii) The device which is known as Thyristor is _____
A) Diode B) FET
C) Transistor D) SCR

iv) In FET the gate source junction is _____
A) Forward biased B) Reverse biased
C) Unbiased D) None of these

4 b. Explain the working of FET with neat circuit diagram and relevant characteristics. Indicate each region of the characteristics. **(08 Marks)**

c. Explain the working of UJT with neat circuit diagram. Indicate all regions in the characteristics. **(08 Marks)**

PART – B

5 a. Choose your answers for the following : **(04 Marks)**

i) The coupling capacitors in RC coupled amplifier affect _____ frequency response.
A) Low B) High
C) Very high D) Above 100 kHz.

ii) The frequency at which oscillator will operate is the frequency for which the phase shift of the loop gain is _____
A) 0° B) 360°
C) 180° D) Both (A) and (B).

iii) In an oscillator the phase shift produced by amplifier is _____
A) 0° B) 180°
C) 90° D) 270°

iv) The oscillator used to generate oscillations in audio frequency range is _____
A) LC oscillator B) RC oscillator
C) Crystal oscillator D) Both (B) and (C)

b. Explain the working of RC phase shift oscillator with neat circuit diagram and waveforms at each stage. **(08 Marks)**

c. List the effects of negative feedback. **(04 Marks)**

d. In a transistor Hartley oscillator, $L_1 = 10\ \mu H$, $L_2 = 10\ \mu H$. Find the value of C required for an oscillating frequency of 150 kHz. Take M = 0. **(04 Marks)**

6 a. Choose your answers for the following : **(04 Marks)**

i) An op-amp has _____ o/p impedance.
A) ∞ B) 0
C) 10000 Ω D) 600 Ω

ii) Voltage follower has _____ gain.
A) High B) Low
C) Unity D) None of these

iii) An op-amp non-inverting amplifier has $R_1 = 1\ k\Omega$ and $R_f = 3\ k\Omega$ when $V_i = -2$ V, the output is _____
A) – 4 V B) 4 V
C) 8 V D) – 8 V

iv) Op-amp configuration used as buffer is _____
A) Inverting amplifier B) Non inverting amplifier
C) Voltage follower D) Adder

b. List the characteristics of ideal op-amp and practical op-amp. **(08 Marks)**

c. The input to the op-amp shown in Fig. Q6 (c), at the non inverting terminal is $10 \sin 10t$ Volts. Draw the output waveform indicating time period and maximum value. **(04 Marks)**

d. Find the output of the op-amp circuit shown in Fig. Q6 (d). **(04 Marks)**

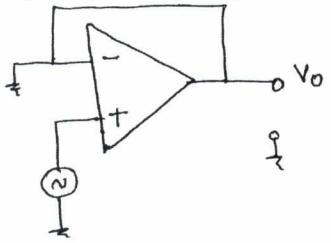

Fig. Q6 (c)

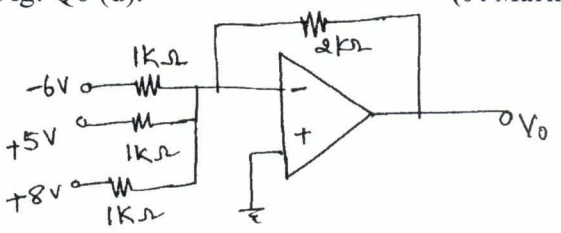

Fig. Q6 (d)

7 a. Choose your answers for the following : **(04 Marks)**

i) $(100)_{10} = (?)_{16}$

A) 64 B) 144
C) 46 D) 80

ii) 75 in binary contains _____ number of 1's.

A) 8 B) 4
C) 6 D) 3

iii) $(16)_8 = (?)_{10}$

A) 18 B) 20
C) 14 D) 25

iv) $(ABC)_{16} = (?)_{10}$

A) 3000 B) 4230
C) 2748 D) 2250

b. Perform the following:

i) $(101110)_2 = (?)_8$

ii) $(110011)_2 - (11001)_2 = (?)_2$ using 2's complement method.

iii) $(E10A2)_{16} - (5FF1)_{16} = (?)_{16}$ using 15's complement method.

iv) $(77721)_8 - (66432)_8 = (?)_8$ using 7's complement method.

v) $(2384)_{16} = (?)_8$. **(05 Marks)**

c. Explain the need for modulation. **(05 Marks)**

d. Explain the working of super heterodyne receiver with neat circuit diagram and waveforms at each stage. **(06 Marks)**

8 a. Choose your answers for the following : **(04 Marks)**

i) The EX-OR gate in which one input is connected to V_{CC}, operates as _____ gate.

A) AND B) OR
C) NOR D) NOT

ii) The gate whose output is zero only when both the inputs are high is _____ gate.

A) NAND B) NOR
C) OR D) AND

iii) $A + \overline{A}B + A$ is _____

A) A B) B
C) $A + \overline{B}$ D) A + B

iv) Universal gates are,

A) NAND and NOR B) AND and NAND
C) OR and NOR D) NOR and EX-OR

b. What is half adder and implement it using universal gates? **(06 Marks)**

c. Simplify and realize the Boolean expressions, using two i/p NAND gates only.

i) $ABCD + A\overline{B}CD$

ii) $AB + ABC + AB\overline{C} + \overline{A}BC$

iii) $ABCD + \overline{A}BCD + ABD$ **(10 Marks)**

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10ELE15/25

First/Second Semester B.E. Degree Examination, June 2012

Basic Electrical Engineering

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer any FIVE full questions, choosing at least two from each part.***
2. ***Answer all objective type questions only on OMR sheet page 5 of the answer booklet.***
3. ***Answer to objective type questions on sheets other than OMR will not be valued.***

PART – A

1 a. Choose your answers for the following :

i) The current in 5 ohm resistor is

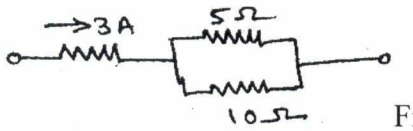

Fig.Q1(a)(i)

A) 2A
B) 3A
C) 1A
D) 1.5A

ii) The total resistance of parallel circuit is
A) less than the smallest resistance B) more than the smallest resistance
C) more than the highest resistance D) none of these

iii) Inductance opposes _____ in current in a circuit.
A) only increase B) only decrease C) change D) none of these

iv) If coefficient of coupling between two coils is increased, mutual inductance between the coils _____.
A) is increased B) is decreased
C) remains unchanged D) none of these **(04 Marks)**

b. List out advantages of parallel circuit over series circuit. List out characteristics of parallel circuit. **(06 Marks)**

c. Deduce an expression for stored energy in a magnetic field. **(04 Marks)**

d. Find current in the battery, the current in each branch and p.d. across AB in the network shown in Fig.Q1(d). **(06 Marks)**

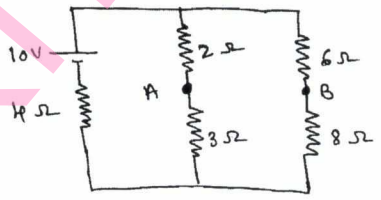

Fig.Q1(d)

2 a. Choose your answers for the following :

i) A coil is rotating in the uniform field of a 10-pole generator. In one revolution of the coil, the number of cycles generated by voltage is _____.
A) 10 B) 5 C) 2.5 D) 4

ii) The average value of sine wave over a one complete cycle is
A) zero B) +1 C) –1 D) $\frac{1}{2}$

iii) The voltage of the applied source in the circuit of fig.Q2(a)(iii) is

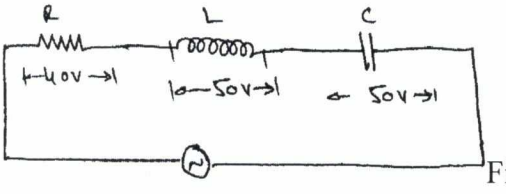

Fig.Q2(a)(iii)

A) 50 V
B) 100 V
C) 40 V
D) 140 V

2 a iv) The power taken by the circuit shown is

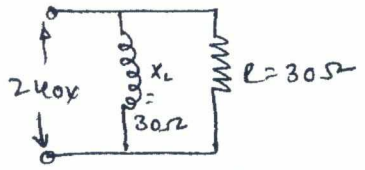

Fig.Q2(a)(iv)

A) 480 W
B) 1920 W
C) 1200 W
D) none of these **(04 Marks)**

b. With the help of circuit diagram and phasor diagram, find the phase angle, impedance and power in case of R-L series circuit. **(08 Marks)**

c. An alternating current of frequency 60 Hz has a maximum value of 120 A.
i) Write down equation for the instantaneous value.
ii) Reckoning time from the instant the current is zero and becoming positive, find the instantaneous value after 1/360 sec.
iii) Time taken to reach 96 A for the first time. **(04 Marks)**

d. A 60 Ω resistor is connected in parallel with an inductive reactance of 80 Ω to a 240 V, 50 Hz supply. Calculate: i) The current through the resistor and inductance, ii) The supply current, iii) The circuit phase angle. Draw phasor diagram. **(04 Marks)**

3 a. Choose your answers for the following :
i) Three inductive coils each having an impedance of 17.7 Ω are connected in star. The circuit is fed from a 3-phase, 400 V, 50 Hz supply. The current (line) drawn by the circuit is equal to
A) 22.6 A B) 39.14 A C) 13 A D) none of these
ii) For a 3-phase star connected balanced circuit having inductive load, the angle between the line currents and corresponding line voltages is equal to
A) 30^o B) $30^o - \phi$ C) $30^o + \phi$ D) ϕ
iii) When two wattmeters are connected in a 3-phase circuit to measure its total power consumption, one of the wattmeter would read zero, when the load power factor is,
A) 0.2 lagging B) unity C) 0.5 lagging D) zero
iv) Active power drawn by a 3-phase balanced load is given by
A) $P = V_L I_L \cos\phi$ B) $P = \sqrt{3}\, V_L I_L$
C) $P = \sqrt{3}\, V_L I_L \cos\phi$ D) $P = \sqrt{3}\, V_{ph} I_{ph} \cos\phi$ **(04 Marks)**

b. With the aid of a phasor diagram obtain the relationship between the line and phase values of voltages in a three-phase, star connected system. **(08 Marks)**

c. The three arms of a three-phase load each comprise an inductor of resistance 25 Ω and of inductance 0.15 H in series with a 120 μF capacitor. The supply voltage is 415 V, 50 Hz. Calculate the line current and total power in watts, when the three arms are connected in delta. **(08 Marks)**

4 a. Choose your answers for the following :
i) The type of wattmeter commonly used for measurement of power in ac circuit is
A) rectifier type B) dynamometer type
C) moving iron type D) thermo-couple type
ii) In energy meter, constant speed of rotation of disc is provided by
A) shunt magnet B) series magnet
C) braking magnet D) none of these
iii) Earthing of electrical installation is carried out to protect
A) equipments from damage B) personnel against electric shock
C) equipments from short circuit D) all of these
iv) The effect of electric current on vital human organs depends upon
A) magnitude of current B) duration of current
C) frequency of current D) all of these **(04 Marks)**

4 b. With a neat sketch, explain the construction and principle of operation of single phase induction type energy meter. **(08 Marks)**

c. Name different types of domestic wiring and explain any one type of wiring. **(05 Marks)**

d. List out some safety measures against electric shocks. **(03 Marks)**

PART – B

5 a. Choose your answers for the following :

i) The rotating part of d.c. machine is called _____.

A) armature B) field system C) frame D) yoke

ii) E.M.F. of d.c. machine s inversely proportional to

A) flux/pole B) poles

C) conductors D) number of parallel paths

iii) Torque in d.c. motor is proportional to

A) only flux B) only I_a

C) both flux and I_a D) none of these

iv) At the moment of starting a d.c. motor, its back emf is

A) zero B) maximum C) minimum D) optimum **(04 Marks)**

b. Derive e.m.f. equation of a d.c. generator. **(06 Marks)**

c. Explain the principle of torque production in d.c. motor. **(04 Marks)**

d. An 8-pole, lap-connected armature has 40 slots with 12 conductors per slot, generates a voltage of 500 V. Determine the speed at which it is running if the flux per pole is 50 mwb. **(06 Marks)**

6 a. Choose your answers for the following :

i) Which of the following does not change in an ordinary transformer?

A) voltage B) current C) frequency D) all of these

ii) A transformer has full load copper loss of 800 W and core loss of 600 W. Total loss at no load will be approximately.

A) 1400 Watts B) 1100 Watts C) 1000 Watts D) 600 Watts

iii) The efficiency of a transformer at fuel load 0.8 pf lag is 95%. The efficiency at 0.8 pf lead is

A) 99% B) 95.5% C) 95% D) 90%

iv) A single phase transformer has 250 turns on primary and 1000 turns on the secondary winding. If the primary winding is connected across a 230 V, 50 Hz, single phase supply, the voltage induced in the secondary winding is

A) 920 V B) 230 V C) 1840 V D) 690 V **(04 Marks)**

b. Explain briefly the principle of operation of transformer and show that the voltage ratio of the primary and secondary winding is the same as their turns ratio. **(08 Marks)**

c. A transformer is rated at 100 KVA. At full load its copper loss is 1200 W and its iron loss is 960 W. Calculate:

i) The efficiency at full load, unity power factor

ii) The efficiency at half load, 0.8 p.f.

iii) The load KVA at which maximum efficiency will occur

iv) Maximum efficiency at 0.85 p.f. **(08 Marks)**

7 a. Choose your answers for the following :

i) The frequency of voltage generated by an alternator having 8-poles and rotating at 250 rpm is

A) 60 Hz B) 50 Hz C) 25 Hz D) $16\frac{2}{3}$ Hz

7 a. ii) In modern alternators, the rotating part is
A) field B) armature
C) field and armature D) none of these

iii) An alternator has a phase sequence of RYB for its phase voltage. In case the direction of rotation of alternator is reversed, the phase sequence will become
A) RBY B) RYB
C) YRB D) none of these

iv) Alternators have short-pitched winding so as to
A) increase machine rating B) improve the voltage waveform
C) improve generated voltage D) none of these **(04 Marks)**

b. Explain the essential difference between cylindrical and salient pole rotors. **(04 Marks)**

c. Derive e.m.f equation of an alternator. **(06 Marks)**

d. A 3-phase, 6-pole, star connected alternator revolves at 1000 rpm. The stator has 90 slots and 8 conductors per slot. The flux per pole is 0.05 wb. Calculate voltage generated, if $K_W = 0.96$. **(06 Marks)**

8 a. Choose your answers for the following :

i) The speed at which the rotating magnetic field produced by stator currents rotates is
A) synchronous speed B) rotor speed
C) greater than synchronous speed D) none of these

ii) When an induction motor is at standstill its slip is
A) zero B) 0.5 C) 1 D) infinity

iii) If N_S is synchronous speed and 's' is the slip, then the actual running speed of an induction motor will be
A) N_S B) sN_S C) $(1 - s)N_S$ D) $(N_S - 1)s$

iv) Initial starting current drawn by a 3-phase induction motor in terms of full load current on application of rated voltage (approximately) is:
A) equal to full load current B) 2 times
C) more than 10 times D) 5 times (appx) **(04 Marks)**

b. Explain the principle of operation of a 3-phase induction motor. **(06 Marks)**

c. Deduce an expression for the frequency of rotor current in an induction motor. **(04 Marks)**

d. A 3-phase, 6-pole, 50 Hz induction motor has a slip of 1% at no load, and 3% at full load. Determine: i) synchronous speed, ii) no-load speed, iii) full load speed, iv) frequency of rotor at stand still, v) frequency of rotor current at full load. **(06 Marks)**

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Question Paper Version : D

First/Second Semester B.E Degree Examination, June 2012
Environmental Studies
(COMMON TO ALL BRANCHES)

Time: 2 hrs.] [Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

1. Answer all FIFTY questions; each question carries ONE Mark.
2. Use only **Black ball point pen** for darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting and using whiteners** on the **OMR** sheet are strictly prohibited.

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1. Global warming may bring about the following changes in climate of the earth:
   a) Increase in the rain fall b) Desertification
   c) Drought d) All of the above
2. The protocol that reduces green house gas emission are,
   a) Kyoto protocol b) Cartagena protocol
   c) Montreal protocol d) Vienna protocol
3. Ozone layer thickness is measured in,
   a) millimeter b) centimeter c) decibel d) Dobson units
4. Which of the following is not a green house gas?
   a) Hydrochlorofluorcarbons, b) Methane
   c) Carbon dioxide d) Oxygen
5. Ozone layer is present in,
   a) Troposphere b) Stratosphere c) Mesosphere d) Thermosphere
6. India has the world's largest share of which of the following?
   a) Manganese b) Mica c) Copper d) Diamond
7. Environmental (protection) act was enacted in the year,
   a) 1986 b) 1992 c) 1984 d) 1974
8. The Central Pollution Control Board (CPCB) was established in the year,
   a) 1974 b) 1982 c) 1986 d) 1976

9. Which of the following is NGO?
   a) Narmada Bachao Andolan b) CPCB
   c) KSPCB d) None of these
10. The leader of chipko movement is
    a) Sunderlal Bahuguna b) Medha Patkar
    c) Vandana Shiva d) Suresh Hebilkar
11. Which state is having highest woman literacy rate in India?
    a) Karnataka b) Punjab c) Rajasthan d) Kerala
12. ISO 14000 standards deals with:
    a) Pollution management b) Risk management
    c) Environmental management d) None of these
13. Silent valley movement succeeded in,
    a) Waste management in sea coast
    b) Canceling the state government Hydal project and saving the Lion-tailed monkeys
    c) Promoting marine fishery business in Kerala
    d) None of the above
14. World Summit on sustainable development was held at
    a) Johannesburg in 2002 b) Rio de Janeiro in 1992
    c) Kyoto in 1994 d) Stockholm in 2000
15. Chlorofluro carbon releases a chemical harmful to ozone is:
    a) Chlorine b) Fluorine c) Nitrogen peroxide d) Sulphur dioxide
16. Green house effect is related to,
    a) green trees on house b) global warming
    c) grass land d) greenery in country
17. Taj Mahal at Agra may be damaged by,
    a) Sulphur dioxide b) Chlorine c) Hydrogen d) Oxygen
18. Dysentry spreads due to,
    a) Food adultration b) Humid weather c) Water pollution d) Air pollution
19. Sound becomes hazardous noise pollution at _____ decibels,
    a) above 30 b) above 80 c) above 100 d) above 120
20. Kaziranga National Park is famous for,
    a) Tiger b) Musk deer c) Elephant d) Rhinoceros
21. Excess of fluorides in drinking water is likely to cause_____
    a) Blue babies b) Fluorosis c) Taste and odour d) Fever
22. Nitrogen fixing bacteria exists in _____ of plants
    a) Leaf b) Roots c) Stem d) Flower

23. Forest rich area in Karnataka is found in _____
a) Western ghats b) Bandipur c) Mangalore d) None of these

24. _____ are referred to as Earth's lungs
a) Forest b) Carbon cycle c) Water sources d) Mines

25. Which of the following is considered as an alternate fuel?
a) CNG b) Kerosene c) Coal d) Petrol

26. Biomass power generation uses
a) Crop b) Animal dung c) Wood d) All of these

27. Which of the following is not a renewable source of energy
a) Fossil fuel b) Solar energy c) Wave energy d) Wind energy

28. Chernobyl nuclear disaster occured in the year
a) 1984 b) 1987 c) 1986 d) 1988

29. Nuclear waste is active for _____
a) 5 years b) 10 years c) 50 years d) Centuries

30. BOD is
a) Biochemical oxygen demand b) Usually less than COD
c) A measure of the organic matter present in waste water
d) All of the above

31. The universal declaration of human rights was proclaimed by the UN in the year
a) 1946 b) 1947 c) 1948 d) 1949

32. The major objectives of Family welfare programmes in India is
a) Disease control b) Population growth rate control
c) Employment generation d) None of these

33. Noise is,
a) Loud sound b) Unwanted sound
c) Constant sound d) Sound of high frequency

34. Which of the following devices is suitable for removal of gaseous pollutants?
a) Cyclonic separator b) Fabric filter
c) Electostatic precipitator d) Wet collector

35. Demography is the study of
a) Animals behvior b) Population growth
c) River d) None of these

36. The word 'Environment' is derived from,
a) Greek b) French c) Spanish d) English

37. The objectives of environmental education are:
a) To raise consciousness about environmental conditions.
b) To teach environmentally appropriate behavior
c) To create an environmental ethics
d) All of the above

38. Which of the following components of the environment is having the least storage capacity of matter?
a) Atmosphere and hydrosphere b) Atmosphere and Lithosphere
c) Hydrosphere and Lithosphere d) Biosphere and Lithosphere

39. In an ecosystem, the flow of energy is,
a) Bidirectional b) Cyclic
c) Unidirectional d) None of these

40. The sequence of eating and being eaten in an ecosystem is called,
a) Food chain b) Food web c) Water cycle d) Anthroposystem

41. The largest reservoir of nitrogen in our planet is,
a) Biosphere b) Atmosphere
c) Lithosphere d) Fossil fuels

42. Which of the following is not the environmental effect of industrialization,
a) Solid waste b) Air pollution c) Water pollution d)Economic growth

43. Mining means,
a) to conserve and preserve minerals b) to check pollution due to mineral resource
c) to extract minerals and ores d) None

44. E.I.A stands for :
a) Environment and Industrial Act b) Environment and Impact activity
c) Environmental impact assessment d) Environmentally important activity

45. E.I.A is related to :
a) Resource conservation b) Efficient equipment process
c) Waste minimization d) All of the above

46. Environmental day is held every year on,
a) June 5^{th} b) July 5^{th} c) June 10^{th} d) April 22^{nd}

47. Soil erosion removes surface soil which contain,
a) Organic matter b) Plant nutrients
c) Both a and b d) None of the above

48. Water logging is a phenomenon in which,
a) Crop patterns are rotated b) Erosion of soil
c) Soil root zone becomes saturated due to over irrigation.
d) None of the above

49. Forests prevent soil erosion by binding soil particles in their
a) Stems b) Roots c) Leaves d) Buds

50. What is the permissible range of p^H for drinking water as per the Indian standards?
a) 6 to 9 b) 6.5 to 7.5 c) 6 to 8.5 d) 6.5 to 8.5

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Question Paper Version : A

First/Second Semester B.E Degree Examination, June 2012
CONSTITUTION OF INDIA AND PROFESSIONAL ETHICS
(COMMON TO ALL BRANCHES)

Time: 2 hrs.] [Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

1. Answer all FIFTY questions; each question carries ONE Mark.
2. Use only **Black ball point pen** for darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting and using whiteners** on the OMR sheet are strictly prohibited.

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1. Preamble declares the objectives of constitution as
   a) Secularism b) Justice, Liberty, Equality and Fraternity
   c) Democratic socialist d) Liberalism
2. Preamble declares that the constitution of India was adopted on
   a) 15th August, 1947 b) 26th January, 1950
   c) 6th December, 1945 d) 26th November, 1949.
3. Indian constitution has
   a) 410 articles b) 358 articles
   c) 401 articles d) 395 articles
4. Indian constitution has
   a) 12 Schedules b) 7 Schedules c) 9 Schedules d) 10 schedules.
5. Secularism means .
   a) absence of state religion b) right to religious freedom
   c) equality of all religions d) all the above
6. Which Article of Indian Constitution lays down the method of amendment?
   a) Article 371 b) Article 368
   c) 42nd Amendment d) 44th Amendment.
7. The constitution lays down how many fundamental duties of a citizen?
   a) 6 b) 11 c) 15 d) 20
8. Which is not a fundamental right?
   a) Right to freedom b) Right to constitutional remedies
   c) Right to property d) Right to equality.

9. Directive principles of state policy have been described in Articles.
   a) 36 to 51 b) 1 to 11 c) 12 to 35 d) 19 to 27
10. Union list has
    a) 95 subjects b) 97 subjects c) 105 subjects d) 66 subjects
11. Centre can declare constitutional emergency in a state under article
    a) 152 b) 360 c) 356 d) 365
12. In India the Residuary Powers are with
    a) State Government b) Union Government
    c) Local Government d) Government of Union Territories.
13. India has a
    a) Democracy b) Presidential System
    c) Direct democracy d) Parliamentary democracy
14. President of India is elected by
    a) Elected MPs b) All elected MPs and all elected MLAs
    c) Elected MLAs d) All MPs and MLAs
15. Who has the emergency powers?
    a) Prime Minister b) Union Cabinet
    c) President of India d) Union Parliament
16. Who appoints the prime minister?
    a) The President of India
    b) The Loksabha
    c) The majority party in the Laksabha
    d) The people of India.
17. Meghalaya has how many seats in Rajya Sabha?
    a) One b) Two c) Three d) Four
18. Which is exclusive power of Rajya Sabha?
    a) To initiate money bills b) To impeach the President
    c) To declare a subject of State list as a subject of National importance
    d) To remove Prime minister.
19. The constitution of India is
    a) rigid b) flexible
    c) partly rigid and partly flexible d) very rigid
20. The Fundamental Rights of Indian citizen are contained in
    a) Part III of constitution b) Part IV of constitution
    c) The Seventh schedule of the constitution
    d) None of these
21. Supreme Court of India has how many judges?
    a) 24 b) 25
    c) One Chief Justice and 25 other Judges
    d) 13

22. What is the tenure of member of Rajya Sabha?
a) 6 years b) 3 years c) 5 years d) No fixed tenure

23. The Chief Justice of India is appointed on principle of
a) Merit b) Will of President
c) Seniority d) Election by the Judges

24. The Directive Principles of state policy are
a) Justiciable b) Non Justiciable
c) Only some directive principles are justiciable
d) None of these

25. To be eligible for election as President, a candidate must be
a) over 35 years of age b) over 60 years of age
c) over 65 years of age d) there is no age limit

26. How many types of emergencies have been envisaged by the constitution?
a) only one b) two c) three d) four

27. The President can proclaim National Emergency only on written advice of
a) The Prime Minister b) The Union cabinet
c) The Chief Justice of India d) The Speaker of Lok Sabha

28. The tenure of Vice President is
a) Co – terminus with that of the President
b) Five years
c) Dependent on the will of the President
d) Six years

29. Prime Minister is
a) the head of the state b) the head of the government
c) the head of state as well as head of government
d) None of these

30. What can be the maximum strength of the Lok Sabha?
a) 500 b) 545 c) 552 d) 550

31. How many seats have been reserved for Union Territories in Lok Sabha?
a) 20 b) 25 c) 30 d) None of these

32. Rajya Sabha can have maximum strength of
a) 250 members b) 225 members c) 330 members d) 350 members

33. What can be the maximum gap between two sessions of parliament?
a) Three months b) Four months c) Six months d) Nine months

34. The Supreme court consists of Chief Justice and
a) Seven Judges b) Nine Judges c) 11 Judges d) 25 Judges

35. Who is executive head of State?
a) Chief Minister b) The Governor c) The President d) None of these

36. Can a person act as Governor of more than one state
a) Yes b) No
c) Only for period of six months d) Only for period of one year

37. An ordinance issued by Governor is subject to approval by
a) The President b) The state council of Ministers
c) The State Legislature d) None of these

38. The membership of Legislative Assembly of state varies between
a) 60 & 500 b) 100 & 300 c) 150 & 450 d) 100 & 400

39. The High court of state is directly under
a) The President b) The Supreme Court of India
c) The Governor of the state d) The Chief Justice of India

40. On what ground a Judge of High Court can be removed?
a) Proved misbehaviour or incapacity
b) Insolvency
c) Insanity
d) All of these

41. The amendment procedure of Indian constitution has been modeled on the constitution of
a) South Africa b) Canada c) USA d) Switzerland

42. In India, the citizens have been given the right to vote on the basis of
a) age b) education
c) property qualification d) duration of stay in country

43. Ethics is
a) Normative science b) Natural science
c) Both Normative and Natural d) Objective scheme

44. Work above and beyond full call of duty means
a) good work b) reasonable work
c) work involving high risk d) responsible work

45. Engineering ethics
a) Stimulates to conduct research b) Shines on time management
c) Acquire new skills in engineering, testing and research
d) Stimulates the moral imagination.

46. Study of engineering ethics helps to
a) Recognize ethical issue b) Develop one's knowledge and skill
c) Develops one's moral character d) Provide satisfactory service to public

47. This is not impediment to responsibility
a) Fear b) Self interest
c) Group thinking d) Critical acceptance of authority

48. This is not dishonesty in science and engineering
a) Forging b) Blending c) Trimming d) Cooking

49. Engineers can use code of ethics as guidelines to
a) Resolve the conflicts b) Formulate the problem
c) Shift the responsibility d) Overcome the work pressure

50. Engineers must protect the public from
a) Acceptable risk b) Impending risk
c) Technical risk d) None of these

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10CCP13/23

First/Second Semester B.E. Degree Examination, June 2012
Computer Concepts and 'C' Programming

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer any FIVE full questions, choosing at least two from each part.***
2. ***Answer all objective type questions only on OMR sheet page 5 of the answer booklet.***
3. ***Answer to objective type questions on sheets other than OMR will not be valued.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – A

1 a. Choose your answers for the following : **(04 Marks)**

i) The first mechanical computer designed by Charles Babbage was called
A) Abacus B) Processor
C) Calculator D) Analytical Engine

ii) Integrated circuit was developed in _____ generation of computers
A) FIRST B) SECOND
C) THIRD D) FOURTH

iii) 1 Gigabyte (GB) is equivalent to _____
A) 1024 MB B) 1024 KB
C) 1024 GB D) 1024TB

iv) ASCII is a _____ bit BCD code
A) 4 B) 6
C) 8 D) 10

b. Discuss the basic structure of a computer with a neat block diagram. **(06 Marks)**

c. Explain different types of computers for organizations. **(10 Marks)**

2 a. Choose your answers for the following : **(04 Marks)**

i) A collection of 4 bits is called
A) Nibble B) Byte C) Word D) Record

ii) Which of the operating system is not a GUI based?
A) WINDOWS B) LINUX C) MAC D) DOS

iii) Which is a secondary memory device?
A) Cache B) RAM C) Registers D) Floppy disk

iv) Which of the following is not a layer in the OSI model?
A) Presentation B) Transport C) Session D) Communication

b. Enlist various secondary storage devices. Explain how data can be stored and retrieved from CD-ROM. **(06 Marks)**

c. What is an operating system? What are the major functions of an operating system? **(06 Marks)**

d. Write a note on the need for networking. **(04 Marks)**

3 a. Choose your answers for the following : **(04 Marks)**

i) 'C' language is a _____

A) Structured language B) Object-oriented language
C) Machine language D) Assembly language

ii) Identify valid identifier

A) a123 B) $123
C) 123a D) a#123

iii) A step by step procedure to solve a given problem is called

A) Logarithm B) Algorithm
C) Flowchart D) Program

iv) The range of char data types on 16 bit machines is:

A) -126 to 127 B) -128 to 127
C) -127 to 128 D) -127 to 127

b. Explain the different phases of solving a given problem using computer. **(10 Marks)**

c. Write an algorithm and flowchart to calculate factorial of a number. **(06 Marks)**

4 a. Choose your answers for the following : **(04 Marks)**

i) The operator % yields

A) Quotient B) Remainder
C) Percentage D) Fractional part

ii) Evaluate the expression 10! = 10 || 5 < 4&&8. The result is:

A) 1 B) 0 C) 2 D) 10

iii) Which of the following bitwise operator shifts their first operand to its left?

A) && B) << C) >> D) ^

iv) If a = 10, b = 5 find C = ++a-b. The result is:

A) 5 B) 7 C) 6 D) -6

b. Explain precedence and associativity of operators in 'C' with an example. **(08 Marks)**

c. What is type conversion? What are the different ways of type conversion? Explain with an example. **(08 Marks)**

PART – B

5 a. Choose your answers for the following : **(04 Marks)**

i) What is the output of following program?

```
#include <stdio.h>
Void main( )
{ int num;
  for(num = 0; num <= 10; num ++)
    { ;
    }
  printf("%d", num);
}
```

A) 012345678910 B) 11
C) 10 D) 01234567891011

ii) A for loop with no test condition is known as _____ loop

A) Finite B) Infinite C) While D) do-while

iii) In 'C' which of the following is not a storage class specifier?

A) Static B) Auto C) Const D) Register

iv) Which of the following is the last character that is stored in a char array in 'C'?

A) \0 B) \NULL C) 0 D) /0

b. Describe the different ways of passing parameters to functions. **(08 Marks)**

c. Write a 'C' program using functions, to compute the sum of N numbers. **(08 Marks)**

6 a. Choose your answers for the following : **(04 Marks)**

i) Which of the following command will place the program control out of the loop when it gets executed

A) goto B) Break C) exit D) continue

ii) How many times the following loop will be executed?

```
for(; ;)
{
   printf("Hello");
}
```

A) 1 B) 0 C) Infinite D) Finite

iii) What would be the output of the following code segment?

```
for(i = 1; i< = 5; i++)
{
    if(i = = 3) continue;
    printf("%d", i);
}
```

A) 12 B) 1245 C) 1234 D) 345

iv) The minimum number of times the do-while loop will be executed

A) 0 B) 1 C) 2 D) Both a and b

b. Differentiate between while and do while statements, with an example for each. **(08 Marks)**

c. Write a 'C' program to calculate area of circle, rectangle and triangle using switch statement. Area of circle = π * r * r, Area of rectangle = length × breadth, Area of triangle = 0.5 * base * height. **(08 Marks)**

7 a. Choose your answers for the following : **(04 Marks)**

i) In the following segment of code, what will be the values of x and y after execution, if n assumes a value of zero(0)

```
x = 1; y = 1;
if (n > 0)
{ x = x + 1;
  y = y – 1;
}
printf("%d %d", x, y);
```

A) 0, 0 B) 1, 0 C) 0, 1 D) 1, 1

ii) Arrays can be initialized at

A) Compile time B) Run time C) Both A and B D) None of these

iii) Strncmp( ) function has _____ number of parameters

A) 2 B) 3 C) 1 D) 4

iv) How many times the following while loop is executed?

```
While (0)
{
  Statements;
}
```

A) 0 B) 1 C) Infinite D) Finite

b. What is an array? Write a program to print the sum of two one dimensional array and store the result in another array. **(08 Marks)**

c. Write a program that accepts a string and check whether the string is palindrome or not. **(08 Marks)**

8 a. Choose your answers for the following : **(04 Marks)**

i) Parallel computing is _____ execution of instructions in a computer
   A) Simultaneous B) Serial
   C) Accurate D) Complete

ii) Open MP supports _____
   A) Multi-threaded B) Shared memory
   C) Both a and b D) None of these

iii) Which of the following is not a synchronization construct?
   A) Single B) Master
   C) Section D) Critical

iv) Which of the following is the correct syntax of specifying open MP threads in C?
   A) #pragma omp directive [clause 1] [clause 2]… [clause n]
   B) #pragma openmpdirective [clause 1] [clause 2]…[clause n]
   C) #define omp directive [clause 1]…[clause n] accurate
   D) #define pragma omp directive [clause 1]…[clause n]

b. What is parallel computing? What are the various motivating factors for parallelism? **(10 Marks)**

c. What is open MP? Explain the open MP programming model. **(06 Marks)**

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