I & II

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CBCS Scheme

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15MAT11

First Semester B.E. Degree Examination, Dec.2016/Jan.2017
Engineering Mathematics - I

Time: 3 hrs. Max. Marks: 80

Note: ***Answer FIVE full questions, choosing one full question from each module.***

Module-1

1 a. If $y = e^{-3x}\cos^3 x$, find y_n. **(06 Marks)**

b. Find the angle between the curves

$r = \frac{a}{1+\cos\theta}$ and $r = \frac{b}{1-\cos\theta}$. **(05 Marks)**

c. Find the radius of curvature of the curve $x^4 + y^4 = 2$ at the point (1, 1). **(05 Marks)**

OR

2 a. If $x = \tan(\log y)$, find the value of $(1+x^2)y_{n+1} + (2nx-1)y_n + (n)(n-1)y_{n-1}$. **(06 Marks)**

b. Find the Pedal equation of $\frac{2a}{r} = 1 + \cos\theta$. **(05 Marks)**

c. Find the radius of curvature of the curve $r^n = a^n \cos n\theta$. **(05 Marks)**

Module-2

3 a. Explain $\log(\cos x)$ about the point $x = \frac{\pi}{3}$ upto 3rd degree terms using Taylor's series. **(06 Marks)**

b. Evaluate $\lim_{x\to 0}\left(\frac{\tan x}{x}\right)^{1/x^2}$. **(05 Marks)**

c. State Euler's theorem and use it to find $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y}$ when $u = \tan^{-1}\left(\frac{x^2+y^2}{x+y}\right)$. **(05 Marks)**

OR

4 a. Expand $\frac{e^x}{1+e^x}$ using Maclaurin's series upto and including 3rd degree terms. **(06 Marks)**

b. Find $\frac{du}{dt}$ when $u = x^3y^2 + x^2y^3$ with $x = at^2$, $y = 2at$. Use Partial derivatives. **(05 Marks)**

c. If $u = \frac{x_2x_3}{x_1}$, $v = \frac{x_1x_3}{x_2}$, $w = \frac{x_1x_2}{x_3}$, find the value of Jacobian $J\left(\frac{u,v,w}{x_1,x_2,x_3}\right)$. **(05 Marks)**

Module-3

5 a. A particle moves on the curve $x = 2t^2$, $y = t^2 - 4t$, $z = 3t - 5$, where t is the time find the components of velocity and acceleration at time t = 1 in the direction of $i - 3j + 2k$. **(06 Marks)**

b. Find the divergence and curl of the vector $\vec{V} = (xyz)i + (3x^2y)j + (xz^2 - y^2z)K$ at the point (2, -1, 1). **(05 Marks)**

c. A vector field is given by $\vec{A} = (x^2 + xy^2)\,i + (y^2 + x^2y)j$, show that the field is irrotational and find the scalar potential. **(05 Marks)**

OR

6 a. Find grad ϕ when $\phi = 3x^2y - y^3z^2$ at the point (1, -2, -1). **(06 Marks)**

b. Find a for which $f = (x + 3y)i + (y - 2z)j + (x + az)k$ is solenoidal. **(05 Marks)**

c. Prove that Div(curl $\vec{V}$) = 0. **(05 Marks)**

Module-4

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

b. Evaluate $\int_0^{2a} x\sqrt{2ax - x^2}\, dx$. **(05 Marks)**

c. Solve $(2x \log x - xy)\, dy + 2y\, dx = 0$. **(05 Marks)**

OR

8 a. Obtain the reduction formula of $\int \cos^n x \, dx$. **(06 Marks)**

b. Obtain the Orthogonal trajectory of the family of curves $r^n \cos n\theta = a^n$. Hence solve it. **(05 Marks)**

c. A body originally at 80^0C cools down at 60^0C in 20 minutes, the temperature of the air being 40^0C. What will be the temperature of the body after 40 minutes from the original? **(05 Marks)**

Module-5

9 a. Find the rank of the matrix

$$A = \begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}.$$ **(06 Marks)**

b. Solve by Gauss – Jordan method the system of linear equations
$2x + y + z = 10$, $3x + 2y + 3z = 18$, $x + 4y + 9z = 16$. **(05 Marks)**

c. Find the largest eigen value and the corresponding Eigen vector by power method given that

$$A = \begin{bmatrix} 2 & 0 & 1 \\ 0 & 2 & 0 \\ 1 & 0 & 2 \end{bmatrix}.$$ (Use $[1\ 0\ 0]^T$ as the initial vector). (Apply 4 iterations). **(05 Marks)**

OR

10 a. Use Gauss – Seidel method to solve the equations **(06 Marks)**
$20x + y - 2x = 17$
$3x + 20y - z = 18$
$2x - 3y + 20z = 25$. Carry out 2 iterations with $x_0 = y_0 = z_0 = 0$.

b. Reduce the matrix $A = \begin{bmatrix} -1 & 2 & -2 \\ 1 & 2 & 1 \\ -1 & -1 & 0 \end{bmatrix}$ to the diagonal form. **(05 Marks)**

c. Reduce the quadratic form $3x^2 + 5y^2 + 3z^2 - 2yz + 2zx - 2xy$ to the canonical form. **(05 Marks)**

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CBCS Scheme

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15CHE12/22

First/Second Semester B.E. Degree Examination, Dec.2016/Jan.2017
Engineering Chemistry

Time: 3 hrs. Max. Marks: 80

Note: ***Answer FIVE full questions, choosing one full question from each module.***

Module-1

1 a. Describe the construction and working of Li-MnO_2 battery. **(05 Marks)**

b. Define battery. Explain the following battery characteristics:
(i) Electricity storage density.
(ii) Energy efficiency.
(iii) Cycle life.
(iv) Shelf life. **(05 Marks)**

c. Define reference electrode. Explain the construction and working of Calomel electrode. **(06 Marks)**

OR

2 a. A concentration cell was constructed by immersing two silver electrodes in 0.02 M and 2 M $AgNO_3$ solution. Write the cell representation, cell reactions and calculate the EMF of the cell at 25°C. **(05 Marks)**

b. Derive Nernst equation for single electrode potential. **(05 Marks)**

c. Explain the construction and working of methanol oxygen fuel cell. Mention its application. **(06 Marks)**

Module-2

3 a. What is cathodic protection? Explain how a metal article is protected by sacrificial anodic method. **(05 Marks)**

b. Explain the following factors affecting the rate of corrosion:
(i) Nature of the metal.
(ii) Ratio of anodic to cathodic areas.
(iii) pH. **(05 Marks)**

c. Explain electroless plating of copper with relevant reaction. **(06 Marks)**

OR

4 a. What is metal finishing? Give the technological importance of metal finishing. **(05 Marks)**

b. Explain the influence of the following factors on the nature of electrodeposit:
(i) pH.
(ii) Temperature.
(iii) Concentration of the metal ion. **(05 Marks)**

c. Explain stress and differential metal corrosion with example. **(06 Marks)**

Module-3

5 a. Define cracking. Describe fluidized bed catalytic cracking. **(05 Marks)**

b. What is biodiesel? Explain the synthesis and advantages of biodiesel. **(05 Marks)**

c. Explain the production of solar grade silicon by union-carbide process. **(06 Marks)**

OR

6 a. Define photo voltaic cell. Explain the construction and working of photo voltaic cell. **(06 Marks)**

b. Explain the purification of silicon by zone refining. **(04 Marks)**

c. A 0.6 g of coal sample (carbon 90%, H_2 3% and ash 7%) was subjected to combustion in a bomb calorimeter. Mass of water taken in the calorimeter was 2000 g and the water equivalent of calorimeter was 400 g. The rise in temperature was 3°C. Calculate the gross and net calorific value of the sample. Given, specific heat of water is 4.187 KJ/kg/°C and latent heat of steam is 2454 KJ/kg. **(06 Marks)**

Module-4

7 a. Explain the free radical mechanism for addition polymerization by taking vinyl chloride as an example. **(06 Marks)**

b. Explain the synthesis, properties and applications of epoxy resin. **(04 Marks)**

c. What is glass transition temperature? Explain the following factors affecting glass transition temperature.
(i) Chain flexibility and
(ii) Intermolecular forces. **(06 Marks)**

OR

8 a. Explain structure – property relationship of polymers with respect to,
(i) Crystallinity (ii) Tensile strength **(05 Marks)**

b. What is polymerization? Explain addition and condensation polymerization with example. **(05 Marks)**

c. What are polymer composite? Explain the synthesis, properties and application of Kevlar fibre. **(06 Marks)**

Module-5

9 a. Write a note on fullerenes. Mention its application. **(05 Marks)**

b. Discuss the synthesis of nanomaterials by gas condensation method and chemical vapour condensation processes. **(05 Marks)**

c. Discuss the experimental determination of Dissolved Oxygen (DO) of waste water. Mention the reactions involved in it. **(06 Marks)**

OR

10 a. What is desalination? Discuss the desalination of sea water by ion exchange process. **(05 Marks)**

b. What is boiler feed water? Explain the scale and sludge formation in boilers. **(05 Marks)**

c. Explain any three size dependent properties of nanomaterials. **(06 Marks)**

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15PHY12/22

First/Second Semester B.E. Degree Examination, Dec.2016/Jan.2017
Engineering Physics

Time: 3 hrs. Max. Marks: 80

Note: **1.** ***Answer FIVE full questions, choosing one full question from each module.***
2. Physical Constants : Velocity of light, $c = 3 \times 10^8$ ms^{-1},
Planck's constant, $h = 6.625 \times 10^{-34}$ J.S,
Mass of electron, $m_e = 9.1 \times 10^{-31}$ kg,
Avogadro number, $N_A = 6.02 \times 10^{26}$/Kmol,
Boltzmann constant, $k = 1.38 \times 10^{-23}$ J/K,
Charge of an electron, $e = 1.602 \times 10^{-19}$ C

Module-1

1 a. State Planck's radiation law. Show how Planck's law could be reduced to Wien's law and Rayleigh-Jeans law. **(07 Marks)**

b. State Heisenberg's uncertainty principle and show that electron does not exist inside the nucleus by this principle. **(05 Marks)**

c. Find deBroglie wavelength of a particle of mass 0.58 MeV/c^2 has a kinetic energy 90 eV, where c is velocity of light. **(04 Marks)**

OR

2 a. Using Schrodinger's time independent wave equation obtain eigen values and eigen function for a particle in a one dimensional potential well of infinite height. **(07 Marks)**

b. Define phase velocity and group velocity. Show that group velocity is equal to particle velocity. **(05 Marks)**

c. The inherent uncertainty in the measurement of time spent by Iridium – 191 nuclei in the excited state is found to be 1.4×10^{-10} s. Estimate the uncertainty that results in its energy in eV in the excited state. **(04 Marks)**

Module-2

3 a. Explain Meissner effect. Write any three differences between Type-I and Type-II superconductors. **(07 Marks)**

b. Explain the failure of classical free electron theory. **(05 Marks)**

c. For intrinsic Gallium Arsenide, the electric conductivity at room temperature is 10^{-6} ohm^{-1} m^{-1}. The electron and hole mobilities are respectively 0.85 m^2/V.S and 0.04 m^2/V.S. Calculate the intrinsic carrier concentration at room temperature. **(04 Marks)**

OR

4 a. State law of mass action. Obtain an expression for electrical conductivity of semiconductors. **(07 Marks)**

b. Explain the BCS theory of super conductivity. **(05 Marks)**

c. Calculate the probability of finding an electron at an energy level 0.02 eV above Fermi level at 200 K. **(04 Marks)**

Module-3

5 a. Describe construction and working of carbon dioxide laser with suitable diagrams. **(07 Marks)**

b. Obtain an expression for the numerical aperture of an optical fiber. **(05 Marks)**

c. Find the ratio of population of two energy levels in a medium at thermal equilibrium, if the wavelength of light emitted at 291 K is 6928 Å. **(04 Marks)**

OR

6 a. Describe the recording and reconstruction process in holography with the help of suitable diagrams. **(07 Marks)**

b. Discuss point to point optical fiber communication system. **(05 Marks)**

c. Calculate the numerical aperture and angle of acceptance for an optical fiber having refractive indices 1.563 and 1.498 for core and cladding respectively. **(04 Marks)**

Module-4

7 a. Describe briefly the seven crystal systems. **(07 Marks)**

b. Describe with a neat diagram the crystal structure of diamond. **(05 Marks)**

c. Draw the crystal planes (102) (111) (011) and (002) in a cubic crystal. **(04 Marks)**

OR

8 a. Define atomic packing factor. Calculate the atomic packing factor for sc, bcc and fcc structures. **(07 Marks)**

b. Describe the construction and working of a Bragg's x-ray spectrometer. **(05 Marks)**

c. An x-ray beam of wavelength 0.7 Å undergoes first order Bragg's reflection from the plane (302) of a cubic crystal at glancing angle 35°, calculate the lattice constant. **(04 Marks)**

Module-5

9 a. Explain Ball Milling method of synthesis of nano materials. **(06 Marks)**

b. Describe hand operated Reddy shock tube with diagram. **(05 Marks)**

c. Define shock waves. Mention its applications. **(05 Marks)**

OR

10 a. Explain the working of SEM with the help of a neat diagram. **(07 Marks)**

b. Mention Rankine-Hugonit shock equations and expand the terms. **(05 Marks)**

c. Write any four applications of carbon nano tubes. **(04 Marks)**

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15PCD13/23

First/Second Semester B.E. Degree Examination, Dec.2016/Jan.2017
Programming in C and Data Structures

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 a. Define an Algorithm. Write an algorithm to find the area and perimeter of a rectangle. **(06 Marks)**

b. Write a General structure of C. Explain with an example. **(06 Marks)**

c. Convert the following mathematical expression into C equivalent:

i) area = $\sqrt{s(s-a)(s-b)(s-c)}$

ii) $x = \frac{-b+\sqrt{b^2-4ac}}{2a}$ **(04 Marks)**

OR

2 a. Explain different types of input output functions in C with syntax and examples. **(06 Marks)**

b. Explain the following operators :

i) Unary
ii) Bitwise
iii) Conditional. **(06 Marks)**

c. Draw the flowchart and write a C program to compute simple interest. **(04 Marks)**

Module-2

3 a. List all the conditional control statements used in C. Explain any two with syntax and example. **(06 Marks)**

b. Write a C program that reads from the user an arithmetic operator and two operands perform the corresponding arithmetic operation on the operands using switch statement. **(06 Marks)**

c. Implement a C program to find the reverse of an integer number and check whether it is palindrome or not. **(04 Marks)**

OR

4 a. What are unconditional control statements? Explain any two with example. **(06 Marks)**

b. List the types of looping statements in C. Explain any two with syntax and example. **(06 Marks)**

c. Develop a C program to read a year as an input and find whether it is Leap year or not. **(04 Marks)**

Module-3

5 a. What is Array? Explain the declaration and initialization of one dimensional and two dimensional Array with example. **(06 Marks)**

b. Explain any four string manipulation library function with example. **(04 Marks)**

c. Write a C program to implement string copy operation STRCOPY (str1, str2) that copies a string str1 to another string str2 without using Library function. **(06 Marks)**

OR

6 a. What is string? Write a C program that reads a sentence and prints the frequency of each of the vowels and total count of consonants. **(06 Marks)**

b. What is a Function? Explain the type of functions based on parameters. **(06 Marks)**

c. What is Recursion? Write a C program to compute polynomial co-efficient ${}^{n}C_{r}$ using Recursion. **(04 Marks)**

Module-4

7 a. What is structure? Explain the C Syntax of structure declaration with example. **(04 Marks)**

b. What is a FILE? Explain any five file manipulation functions with example. **(06 Marks)**

c. What are actual and formal parameters? Explain various storage classes available in C. **(06 Marks)**

OR

8 a. Explain array of structure and structure within a structure with an example. **(06 Marks)**

b. Write a C program to maintain a record of 'n' students details using an array of structures with four fields (roll no, name, marks and grade). Assume appropriate data type for each field. Print the marks of the student given the student name as input. **(06 Marks)**

c. Explain various modes of FILE with example. **(04 Marks)**

Module-5

9 a. What is a pointer? Explain how the pointer variable is declared and initialized. **(04 Marks)**

b. What is dynamic memory allocation? Explain different dynamic memory allocation functions in C. **(06 Marks)**

c. Write a C program using pointers to compute the Sum, Mean and Standard deviation of all elements stored in an array of 'n' real numbers. **(06 Marks)**

OR

10 a. Explain the Array of pointers with example. **(04 Marks)**

b. Explain any two pre-processor directives in C. **(04 Marks)**

c. What is Stack? Explain operations on Stack. **(04 Marks)**

d. What is a Queue? Explain its applications. **(04 Marks)**

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15CIV13/23

First Semester B.E. Degree Examination, Dec.2016/Jan.2017
Elements of Civil Engineering and Engineering Mechanics

Time: 3 hrs. Max. Marks: 80

Note: ***Answer FIVE full questions, choosing one full question from each module.***

Module-1

1 a. Explain briefly the scope of the following civil engineering fields. **(04 Marks)**
i) Hydraulics ii) Transportation engineering.

b. Explain on what bases under which the dams are classified. **(05 Marks)**

c. Replace the horizontal force of 600N acting on the lever by an equivalent system consisting of a force and a couple at 0 as shown in fig.Q1(c). **(07 Marks)**

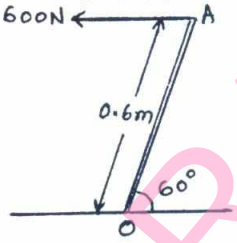


Fig.Q1(c)

OR

2 a. Give the comparison of Flexible and Rigid pavements. Also give their advantages and limitations. **(04 Marks)**

b. List the various systems of forces with their characteristics and an example for each, with a neat sketch. **(05 Marks)**

c. A 100N vertical force is applied to the end of a lever which is attached to a shaft as shown in fig.Q2(c). Determine i) The moment of force about 0.
ii) The horizontal force applied at A which creates same moment about 0.
iii) The smallest force applied at A which creates same moment about 0. **(07 Marks)**

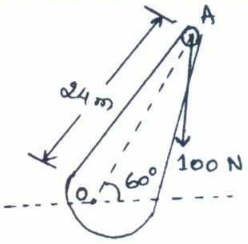


Fig.Q2(c)

Module-2

3 a. State and prove Parallelogram law of forces. **(05 Marks)**

b. Two forces acting on a body are 500N and 1000N as shown in fig. Q3(b). Determine the third force F such that the resultant of all the three forces is 1000N directed at 45^0 to the x – axis. **(06 Marks)**

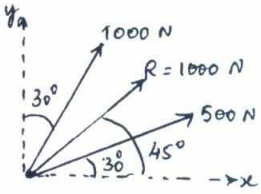
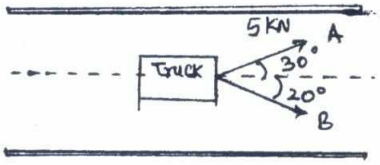


Fig.Q3(b)

c. A truck is to be pulled along a straight road as shown in fig. Q3(c).
i) If the force applied along rope A is 5kN inclined at 30^0, what should be the force in the rope B, which is inclined at 20^0, so that vehicle moves along the road.
ii) If force of 4kN is applied in rope B at what angle rope B should be inclined so that the vehicle is pulled along the road. **(05 Marks)**

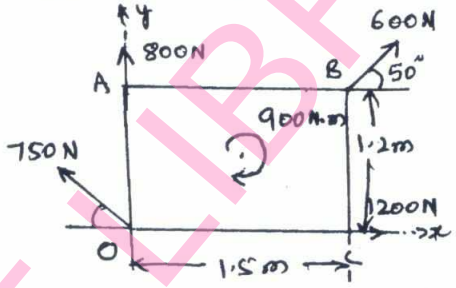
Fig.Q3(c)



OR

4 a. With a neat sketch, explain the basics of static friction and kinetic friction. **(03 Marks)**
b. A block of mass 10 kgs placed on an inclined plane is subjected a force F which is parallel to the plane. Taking inclination of the plane with respect to the horizontal as 30^0 and coefficient of friction between the block and the plane is 0.24. Determine the value of F for i) Impending motion of the block down the plane and ii) Impending motion of the block up the plane. Take acceleration due to gravity g = 9.81. **(05 Marks)**
c. Find the resultant of the force system acting on a body OABC as shown in fig.Q4(c). Also find the points where the resultant will cut the X and Y axis. **(08 Marks)**

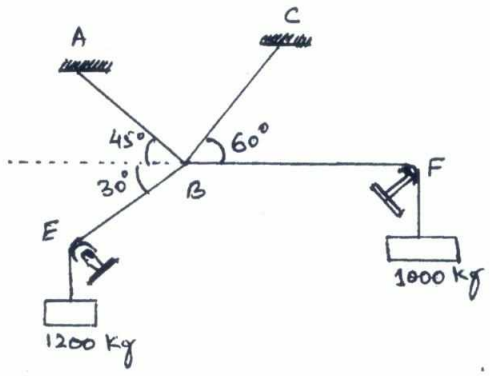
Fig.Q4(c)



Module-3

5 a. Explain the different types of supports and loads in the analysis of beams. **(06 Marks)**
b. Find the forces in cables AB and CB shown in fig.Q5(b). The remaining two cables pass over frictionless pulleys E and F and support masses 1200 kg and 1000kg respectively. **(10 Marks)**

Fig.Q5(b)

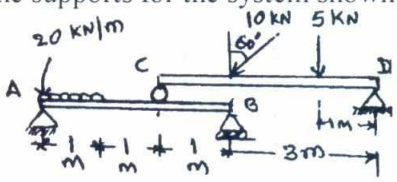


OR

6 a. Define Equilibrant. Explain the conditions for equilibrium of coplanar concurrent force system and coplanar non concurrent force system. **(06 Marks)**

b. Determine the reactions at the supports for the system shown in fig.Q6(b). **(10 Marks)**

Fig.Q6(b)

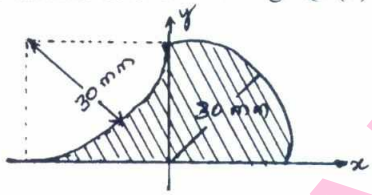


Module-4

7 a. Determine the Moment of inertia of a semi circle about centroid axis parallel to diameter by the method of integration. **(08 Marks)**

b. Determine the centroid of the lamina as shown in fig. Q7(b). **(08 Marks)**

Fig.Q7(b)

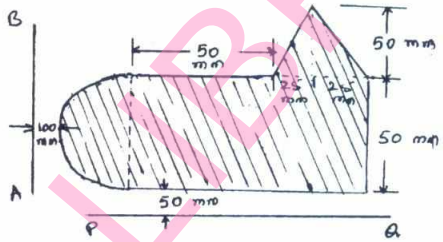


OR

8 a. Determine the centroid for sector of circle by the method of Integration. **(08 Marks)**

b. Find the moment of Inertia of hatched area shown in fig.Q8(b) about the axis PQ. Also determine the radius of gyration. **(08 Marks)**

Fig.Q8(b)



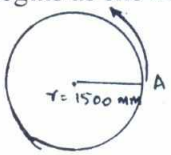
Module-5

9 a. Derive all three basic equations of motion in Kinematics. **(06 Marks)**

b. What is Super elevation and what is its necessity? **(04 Marks)**

c. A horizontal bar on length 1.5m rotates. It accelerates uniformly from 1200 rpm to 1500 rpm in an interval of 5 seconds. Find the linear velocity at the beginning and end of the interval. What are the normal and tangential components of the acceleration at the mid – point of the bar after 4 sec after the acceleration begins as shown in fig. Q9(c)? **(06 Marks)**

Fig.Q9(c)



OR

10 a. Derive the equation to the path of the projectile. **(08 Marks)**

b. A passenger and goods train are moving on a parallel track in same direction. The passenger train 250m length is moving with a constant velocity of 72 kmph. At an instant its engine approaches the last compartment of the goods train. After 25 sec. the engine starts overtaking the engine of goods train. It takes 30 seconds more to completely overtake the goods train. Find the length and speed of goods train. **(08 Marks)**

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CBCS Scheme

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15EME14/24

First/Second Semester B.E. Degree Examination, Dec.2016/Jan.2017
Elements of Mechanical Engineering

Time: 3 hrs. Max. Marks: 80

Note: ***Answer FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Define renewable and non-renewable energy resources and differentiate them. **(06 Marks)**

b. With the help of T–H diagram, explain the generation of steam at constant pressure. **(10 Marks)**

OR

2 a Define : i) Dryness fraction ii) Sensible heat iii) Latent heat iv) Enthalpy of steam. **(04 Marks)**

b. Draw a neat diagram and explain the construction and working of "Liquid flat plate collector" used for water heating applications. **(12 Marks)**

Module-2

3 a. What is steam turbine? Show the classifications of steam turbine. **(06 Marks)**

b. With a neat sketch, explain the working of Franci's turbine. **(10 Marks)**

OR

4 a. With the help of 'P–V' diagram, explain the operation of 4–S petrol engine. **(08 Marks)**

b. Following data are collected from a 4–S single cylinder engine at full load.
Bore = 200mm ; stroke = 280mm ; speed = 300rpm. Indicated mean effective pressure = 5.6 bar, Torque on the brake drum = 250N-m, fuel consumed = 4.2kg/hour, and calorific value of fuel = 41,000kJ/kg.
Determine :
i) Mechanical efficiency
ii) Indicated thermal efficiency, and
iii) Brake thermal efficiency. **(08 Marks)**

Module-3

5 a. With simple sketches, explain the following lathe operations :
i) Facing ii) Cylindrical turning. **(06 Marks)**

b. Define automation. Discuss the types of automation along with their merits and demerits. **(10 Marks)**

OR

6 a. Show the differences between drilling and boring. **(04 Marks)**

b. Define robot. State the different types of robot configurations. **(04 Marks)**

c. Draw a neat diagram to show the robot arm movement in Cartesian configuration and explain. **(08 Marks)**

Module-4

7 a. State the characteristics and applications of : i) Aluminium and its alloys ii) Copper and its alloys. **(08 Marks)**

b. Differentiate between soldering and brazing. **(04 Marks)**

c. State the advantages and disadvantages of welding over other types of joining processes. **(04 Marks)**

OR

8 a. List the advantages and limitations of composites. **(08 Marks)**

b. With a neat diagram, explain the Oxy-acetylene welding process. **(08 Marks)**

Module-5

9 a. Define refrigeration. State the applications of refrigeration. **(04 Marks)**

b. Define the following refrigeration terms :
i) Refrigerant ii) ton of refrigeration iii) COP iv) relative COP. **(04 Marks)**

c. With the help of a flow diagram, explain the functioning of "Vapour compression refrigeration cycle". **(08 Marks)**

OR

10 a. What is refrigerant? State the desired properties of refrigerant. **(06 Marks)**

b. Draw a neat diagram of a room air conditioner and explain. **(10 Marks)**

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CBCS Scheme

USN | | | | | | | | | | |

15ELE15/25

First/Second Semester B.E. Degree Examination, Dec.2016/Jan.2017
Basic Electrical Engineering

Time: 3 hrs. Max. Marks: 80

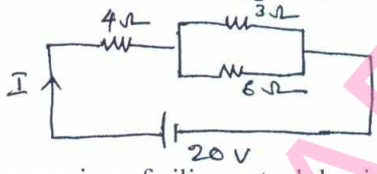
Note: Answer FIVE full questions, choosing one full question from each module.

Module-1

1 a. Define KCL and KVL with an example. **(05 Marks)**

b. From the given below circuit, find the current through 6Ω resistor. [Fig.Q.1(b)]. **(05 Marks)**

Fig.Q.1(b)



c. A coil of 1000 turns is wound on a ring of silicon steel, having mean diameter of 10cm and relative permeability 1200. Its cross sectional area is 12 sq.cm. When a current of 5A flows through the coil, find:
   i) Flux in the core
   ii) Inductance of the coil
   iii) Induced emf if the flux falls to zero in 20m sec. **(06 Marks)**

OR

2 a. Derive an expression for dynamically induced emf with a neat diagram. **(05 Marks)**

b. Two coupled coils of self inductance 0.8H and 0.2H, have a coefficient of coupling 0.9. Find the mutual inductance and turns ratio. **(05 Marks)**

c. A 10Ω resistance is connected in series with a parallel combination of 15Ω and 20Ω resistors. The circuit is applied with V volts. The power taken by the circuit is 150 watts. Find the total current through the circuit and power consumed in all the resistors. **(06 Marks)**

Module-2

3 a. With a neat sketch, explain the construction of various parts of a DC machine. **(05 Marks)**

b. A 4-pole, lap connected DC generator has 600 armature conductors and runs at 1200rpm. If the flux per pole is 0.06 wb, calculate the emf induced. Also find the speed at which it should be driven to produce same emf when wave connected. **(05 Marks)**

c. With a neat figure, explain the construction and working principle of dynamometer type wattmeter. **(06 Marks)**

OR

4 a. Explain the construction and principle of operation of induction type single phase energy meter. **(05 Marks)**

b. 4-pole, 220V, lap connected DC shunt motor has 36 slots, each slot containing 16 conductors. It draws a current of 40A from supply. The field resistance and armature resistances are 110Ω and 0.1Ω respectively. The motor develops an output power of 6kW. The flux per pole in 40m wb. Calculate: i) Speed; ii) Torque developed by armature; iii) Shaft torque. **(05 Marks)**

c. Derive emf equation for DC generator. **(06 Marks)**

Module-3

5 a. Derive an expression for power in pure capacitor circuit and draw voltage, current and power waveforms. **(05 Marks)**

b. A series circuit with a resistor of 100Ω, capacitor of 25μF and inductance of 0.15H is connected across 220V, 50Hz supply. Calculate impedance, current, power and p.f. of circuit. **(05 Marks)**

c. With a neat sketch, explain 3-way control of lamp. **(06 Marks)**

OR

6 a. Define earthing. Explain any one type of earthing with a neat diagram. **(05 Marks)**

b. Two impedances (150-157j)Ω and (100 + 110j)Ω are connected in parallel across 200V, 50Hz supply. Find branch currents, total current and total power consumed in the circuit. Draw the phasor diagram. **(05 Marks)**

c. Define power factor and mention its practical importance. **(06 Marks)**

Module-4

7 a. Mention the advantages of three phase system over single phase system. **(05 Marks)**

b. Three coils each having resistance of 10Ω and inductance of 0.02H are connected in star across 440V, 50Hz, 3ϕ supply. Calculate the line current and total power consumed. **(05 Marks)**

c. A 6-pole, 3ϕ, star connected alternator has an armature with 90 slots and 12 conductors per slot and rotates at 1000 rpm. The flux per pole is 0.5wb. Calculate emf generated, if the winding factor is 0.97 and full pitched. **(06 Marks)**

OR

8 a. With a neat sketch, explain the constructional details of alternator. **(05 Marks)**

b. A 3ϕ, 16 pole alternator has a star connected winding with 144 slots and 10 conductor per slots. The flux per pole is 30mwb. Find the phase and line voltages, if the speed is 375rpm. **(05 Marks)**

c. A 3ϕ, 400V, motor takes an input of 40kW at 0.45 p.f. lag. Find the reading of each of the two single phase wattmeters connected to measure the input. **(06 Marks)**

Module-5

9 a. Explain the working principle of single phase transformer. **(05 Marks)**

b. Find the efficiency of 150kVA, single phase transformer at i) Full load upf; ii) 50% of full load at 0.8p.f. If the copper loss at full load is 1600 watts and iron loss is 1400 watts. **(05 Marks)**

c. A 3ϕ, 4-pole, 400V, 50Hz induction motor runs with a slip of 4%, find rotor speed and frequency. **(06 Marks)**

OR

10 a. Explain the working principle of an 3ϕ induction motor with a neat sketch. **(05 Marks)**

b. A 10 pole induction motor supplied by a 6 pole alternator, which is driven at 1200 rpm. If the motor runs at slip of 3%, what is its speed? **(05 Marks)**

c. A single phase transformer has 400 primary and 1000 secondary turns. The net cross sectional area of core is 60cm^2. The primary winding is connected to 500V, 50Hz. Find: i) Peak value of core flux density; ii) Emf induced in the secondary winding. **(06 Marks)**

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CBCS Scheme

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15ELN15/25

First/Second Semester B.E. Degree Examination, Dec.2016/Jan.2017
Basic Electronics

Time: 3 hrs. Max. Marks: 80

Note: *Answer FIVE full questions, choosing one full question from each module.*

Module-1

1 a. Define the following diode parameters : **(05 Marks)**
   i) Knee voltage
   ii) Maximum forward current
   iii) Peak inverse voltage
   iv) Reverse breakdown voltage
   v) Maximum power rating. **(06 Marks)**

b. With neat circuit diagram and waveform explain the working of Full wave Bridge Rectifier.

c. Draw common emitter circuit. Sketch input and output characteristics. Also explain operating regions by indicating them on characteristic curve. **(05 Marks)**

OR

2 a. Write a note on voltage regulator circuit. **(05 Marks)**

b. Derive the relationship between α and β. Also calculate the α value and β value of a transistor if $I_B = 100\mu A$ and $I_c = 2mA$. **(04 Marks)**

c. With a neat diagram, explain the output characteristics of a transistor in common base configuration. **(07 Marks)**

Module-2

3 a. What is DC load line? Explain with neat circuit the operation of voltage divider bias circuit. **(05 Marks)**

b. What is op-amp? List the characteristics of an ideal op-amp. **(06 Marks)**

c. For the circuit shown in Fig Q3(c). compute
   i) Three transistor currents
   ii) Voltage drop across R_C and R_B. **(05 Marks)**

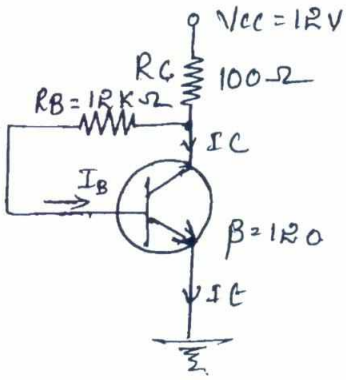

Fig Q3(b)

OR

4 a. Explain how op-amp can be used as
i) An integrator ii) Differentiator iii) Voltage follower. **(06 Marks)**

b. With neat circuit diagram, explain base biased method with necessary equations. **(05 Marks)**

c. Find the output of the following op-amp circuit. **(05 Marks)**

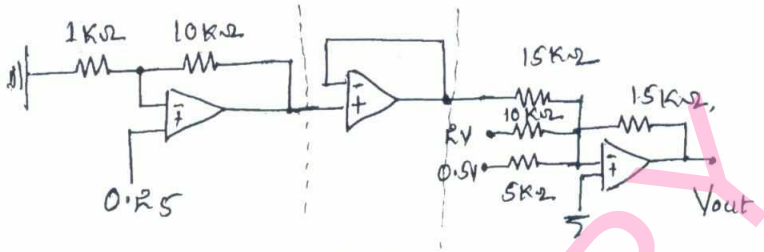

Fig Q4(c)

Module-3

5 a. Convert $(1101101)_2 = (\ )_{10}$ and $(96)_{10} = (\ )_2$. **(04 Marks)**

b. Convert $(FA876)_{16} = (\ )_8$ and $(237)_8 = (\ )_{16}$. **(04 Marks)**

c. Design Full adder circuit. **(08 Marks)**

OR

6 a. State and prove De Morgan's theorem. **(05 Marks)**

b. What are Universal gates? Realize AND, OR Gates using Universal gates. **(05 Marks)**

c. Subtract $(19)_{10}$ from $(15)_{10}$ using 1s and 2s compliment methods. **(06 Marks)**

Module-4

7 a. Write a note on NOR gate latch. **(05 Marks)**

b. Explain the working of clocked RS flip flop using NAND gates. **(06 Marks)**

c. Define microcontrollers. Write their important applications. **(05 Marks)**

OR

8 a. Explain the architecture of 8051 micro controller. **(08 Marks)**

b. Mention the difference between latch and Flip flop. **(02 Marks)**

c. Write a note on interfacing of 8051 microcontroller with stepper motor. **(06 Marks)**

Module-5

9 a. Explain the block diagram of communication system. **(05 Marks)**

b. Define Amplitude modulation. Derive mathematical expression for the same. Draw waveforms. **(06 Marks)**

c. Explain the construction and the principle of operation of LVDT. **(05 Marks)**

OR

10 a. List the differences between Amplitude modulation and frequency modulation. **(05 Marks)**

b. Explain frequency modulation with neat waveforms. **(05 Marks)**

c. A carrier of 10V peak and frequency 100KHz is amplitude modulated by a sine wave of 4V peak and frequency 1000Hz. Determine the modulation index for the modulated wave and draw the amplitude spectrum. **(06 Marks)**

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CBCS Scheme

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15MAT21

Second Semester B.E. Degree Examination, Dec.2016/Jan.2017
Engineering Mathematics - II

Time: 3 hrs. Max. Marks: 80

Note: *Answer FIVE full questions, choosing one full question from each module.*

Module-1

1 a. Solve $(D-2)^2 y = 8(e^{2x} + x + x^2)$ by inverse differential operator method. **(06 Marks)**

b. Solve $(D^2 - 4D + 3) y = e^x \cos 2x$, by inverse differential operator method. **(05 Marks)**

c. Solve by the method of variation of parameters $y'' - 6y' + 9y = \frac{e^{3x}}{x^2}$. **(05 Marks)**

OR

2 a. Solve $(D^2 - 1)y = x \sin 3x$ by inverse differential operator method. **(06 Marks)**

b. Solve $(D^3 - 6D^2 + 11D - 6)y = e^{2x}$ by inverse differential operator method. **(05 Marks)**

c. Solve $(D^2 + 2D + 4) y = 2x^2 + 3e^{-x}$ by the method of undetermined coefficient. **(05 Marks)**

Module-2

3 a. Solve $x^3 y''' + 3x^2 y'' + xy' + 8y = 65 \cos(\log x)$. **(06 Marks)**

b. Solve $xy\,p^2 + p(3x^2 - 2y^2) - 6xy = 0$. **(05 Marks)**

c. Solve the equation $y^2(y - xp) = x^4 p^2$ by reducing into Clairaut's form, taking the substitution $x = \frac{1}{x}$ and $y = \frac{1}{y}$. **(05 Marks)**

OR

4 a. Solve $(2x + 3)^2 y'' - (2x + 3) y' - 12y = 6x$. **(06 Marks)**

b. Solve $p^2 + 4x^5 p - 12x^4 y = 0$. **(05 Marks)**

c. Solve $p^3 - 4xy\,p + 8y^2 = 0$. **(05 Marks)**

Module-3

5 a. Obtain the partial differential equation by eliminating the arbitrary function. $Z = f(x + at) + g(x - at)$. **(06 Marks)**

b. Solve $\frac{\partial^2 z}{\partial x \partial y} = \sin x \sin y$, for which $\frac{\partial z}{\partial y} = -2 \sin y$, when $x = 0$ and $z = 0$, when y is an odd multiple of $\pi/2$. **(05 Marks)**

c. Find the solution of the wave equation $\frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x^2}$ by the method of separation of variables. **(05 Marks)**

OR

6 a. Obtain the partial differential equation by eliminating the arbitrary function $\ell x + my + nz = \phi(x^2 + y^2 + z^2)$. **(06 Marks)**

b. Solve $\frac{\partial^2 z}{\partial y^2} = z$, given that , when $y = 0$, $z = e^x$ and $\frac{\partial z}{\partial y} = e^{-x}$. **(05 Marks)**

c. Derive one dimensional heat equation $\frac{\partial u}{\partial t} = c^2 \frac{\partial^2 u}{\partial x^2}$. **(05 Marks)**

Module-4

7 a. Evaluate $\int_{-1}^{1} \int_{0}^{z} \int_{x-z}^{x+z} (x+y+z)\, dy\, dx\, dz$. **(06 Marks)**

b. Evaluate $\int_{0}^{4a} \int_{\frac{x^2}{4a}}^{2\sqrt{ax}} xy\, dy\, dx$ by changing the order of integration. **(05 Marks)**

c. Evaluate $\int_{0}^{4} x^{3/2} (4-x)^{5/2}\, dx$ by using Beta and Gamma function. **(05 Marks)**

OR

8 a. Evaluate $\int_0^\infty \int_0^\infty e^{-(x^2+y^2)}\, dx\, dy$ by changing to polar co-ordinates. Hence show that $\int_0^\infty e^{-x^2} dx = \sqrt{\pi/2}$. **(06 Marks)**

b. Find by double integration, the area lying inside the circle $r = a \sin\theta$ and outside the cardioid $r = a(1 - \cos\theta)$. **(05 Marks)**

c. Obtain the relation between beta and gamma function in the form $\beta(m, n) = \frac{\Gamma(m)\Gamma(n)}{\Gamma(m+n)}$. **(05 Marks)**

Module-5

9 a. Find i) $L\{e^{-3t}(2\cos 5t - 3\sin 5t)\}$ ii) $L\left\{\frac{\cos at - \cos bt}{t}\right\}$. **(06 Marks)**

b. If a periodic function of period 2a is defined by $f(t) = \begin{cases} t & \text{if } 0 \le t \le a \\ 2a - t & \text{if } a \le t \le 2a \end{cases}$ then show that $L\{f(t)\} = \frac{1}{s^2} \tan h\left(\frac{as}{2}\right)$. **(05 Marks)**

c. Solve the equation by Laplace transform method. $y''' + 2y'' - y' - 2y = 0$. Given $y(0) = y'(0) = 0$, $y''(0) = 6$. **(05 Marks)**

OR

10 a. Find $L^{-1}\left\{\frac{s+3}{s^2 - 4s + 13}\right\}$. **(06 Marks)**

b. Find $L^{-1}\left\{\frac{s}{(s^2 + a^2)^2}\right\}$ by using Convolution theorem. **(05 Marks)**

c. Express $f(t) = \begin{cases} \sin t, & 0 \le t < \pi \\ \sin 2t, & \pi \le t < 2\pi \\ \sin 3t, & t \ge 2\pi \end{cases}$ in terms of unit step function and hence find its Laplace transforms. **(05 Marks)**

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CBCS Scheme

15CPH18/28

USN | | | | | | | | | | |

Question Paper Version : A

First/Second Semester B.E Degree Examination, Dec.2016/Jan.2017

Constitution of India, Professional Ethics & Human Rights

(COMMON TO ALL BRANCHES)

Time: 2 hrs.] [Max. Marks: 40

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the forty questions, each question carries one mark.
2. Use only **Black ball point pen** for writing / 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, using whiteners** on the **OMR** sheets are strictly prohibited.

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1. One of the objectives of the constitution is to achieve
   a) law and order b) justice
   c) political stability d) social control

2. State is authorized to make special provision for _____.
   a) women and children b) men only
   c) men and women d) none of these

3. Freedom of speech and expression means right to express one's own opinion only by _____.
   a) words by mouth b) writing and printing
   c) both (a) and (b) d) none of these

4. Article 21 protects
   a) life only b) liberty only
   c) life and personal liberty d) none of these

5. Telephone tapping is violation of
   a) right to freedom of speech and expression
   b) right to life and personal liberty
   c) right to carry on any profession
   d) right to equality

6. Right to education is a _____.
   a) fundamental right b) ordinary legal right
   c) not a right d) both (a) and (b)

7. Minorities have right to _____.
   a) establish and administer educational institutions
   b) only to establish educational institutions
   c) carry out profession or business
   d) none of these

8. Mandamus means
   a) request b) command c) permission d) all of these

9. The underlying objective of the directive principles is to achieve _____.
   a) police state b) secular state c) welfare state d) none of these

10. 'Equal pay for equal work' is an accomplishment of _____.
    a) right to freedom b) right to religion
    c) right to constitutional remedies d) right to equality

11. Sexual harassment of working women is violation of
    a) fundamental duty b) directive principles of state policy
    c) fundamental right d) rule of law

12. State should protect every monument or place or object declared to be of _____.
    a) state importance b) national importance
    c) international importance d) local importance

13. In Child Labour Abolation case the supreme court has held that the children below the age of _____ cannot be employed in any hazardous industry.
    a) 16 years b) 18 years c) 21 years d) 14 years

14. Name the group, which is created for the election of the president
    a) electoral college b) elected college
    c) electoral commission d) none of these

15. Who is the supreme commander of the defense force of India?
    a) Prime minister b) The president
    c) Chief justice of S.C. d) Parliament

16. Who can allot and transfer the portfolios to the ministers?
    a) The prime minister b) The president
    c) Parliament d) Cabinet

17. What kind of elections takes place to Rajya Sabha?
    a) direct elections b) indirect election
    c) by elections d) mid-term election

18. Annual statement of income and expenditure of the government is known as
    a) agenda b) catalogue c) calendar d) budget

19. The Governor of the state is responsible for his actions to
    a) The state legislative assembly b) The president
    c) The prime minister d) The chief minister

20. This is not the power of the chief minister
a) formation of government
b) control over ministers
c) chief advisor to the governor
d) control over state judiciary

21. The number of ministers including the chief minister shall not exceed _____ of the total number of MLAs.
a) 25%
b) 30%
c) 15%
d) 20%

22. The supreme court has the power to
a) create high courts
b) create the whole judicial system
c) supervise and control the high court
d) none of these

23. Article 243(D) and 243(T) provides for reservation of seats for SC's and ST's in _____.
a) Lok Sabha
b) Rajya Sabha
c) Vidhan Sabha
d) Panchayat Raj

24. The term backward class implies backwardness
a) socially and educationally
b) culturally
c) economically
d) none of these

25. Proclamation of emergency must be laid before _____.
a) both the houses of the parliament
b) either house of parliament
c) before the supreme court
d) none of these

26. President can impose state emergency when he receives a report from the _____.
a) chief minister
b) governor
c) chief justice
d) attorney general

27. Every citizen of the age of _____ years is eligible to vote in an election.
a) 16 years
b) 21 years
c) 22 years
d) 18 years

28. Election disputes can be adjudicated only by _____.
a) high court
b) criminal court
c) civil court
d) election commission

29. Which among the following were given supremacy over fundamental rights?
a) fundamental duties
b) citizenship
c) DPSP
d) none of these

30. What do you mean by 'minimalist approach'?
a) sticking on maximum acceptable standards
b) sticking on minimum acceptable standards
c) sticking on full acceptable standards
d) none of these

31. In 'good work views' focus is given on _____.
a) concept of skillful work
b) concept of legal work
c) concept of logical work
d) the concept of responsibility beyond the legal and moral and call of duty

32. What is one of the hindrances to the responsibility?
a) self-deception b) self-assessment
c) self-realization d) negligence

33. Telling truth when should not is _____.
a) honesty b) Dharma of an engineer
c) misusing of the truth d) business principle

34. Integrity in engineering means _____.
a) quality of being honest and fair b) quality of service to the customer
c) quality of self-esteemed behavior d) quality of self-aggrandizement

35. Plagiarism means _____.
a) Use of intellectual property of others
b) Research work
c) Copying information from other sources
d) None of these

36. Copyright is for _____.
a) 15 years after his or her death b) 20 years after his or her death
c) 50 years after his or her death d) 100 years after his or her death

37. The formulae of a soft drink is an example of
a) trade secret b) patent c) copy right d) trade mark

38. When did the Human Rights Act come into effect?
a) 1951 b) 1989 c) 1993 d) 1995

39. "Human Rights" means the rights relating to
a) life b) liberty c) equality d) all of these

40. Conflict of interest may be
a) potential b) false c) created d) imaginary

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CBCS Scheme

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Question Paper Version : A

First/Second Semester B.E Degree Examination, Dec.2016/Jan.2017
Environmental Studies
(COMMON TO ALL BRANCHES)

Time: 2 hrs.] [Max. Marks: 40

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the forty questions, each question carries **ONE mark**.
2. Use only **Black ball point pen** for writing / 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, using whiteners** on the **OMR** sheets are strictly prohibited.

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1. Which of the following conceptual spheres of the environmental is having the least storage capacity for matter?
   a) Atmosphere b) Lithosphere
   c) Hydrosphere d) Biosphere

2. Biosphere is,
   a) The solid shell of inorganic materials on the surface of the earth.
   b) The thin shell of organic matter on the surface of each comprising of all the living things.
   c) The sphere which occupies the maximum volume of all the spheres.
   d) All of the above.

3. The earth's atmosphere is an envelope of gases present upto a height of about _____ kms.
   a) 10 b) 200 c) 1000 d) 2000

4. Primary consumer is,
   a) Herbivores b) Carnivores c) Macro consumers d) Omnivores

5. World environmental day is on,
   a) 5^{th} May b) 5^{th} June c) 18^{th} July d) 16^{th} August

6. Green revolution is,
   a) Crop variety improvements
   b) Increased use of fertilizers
   c) Expansion of irrigation
   d) All of these

7. Environmental is the life support system that includes,
   a) Air b) Water c) Land d) All of these

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

9. Land conversion through burning of biomass releases,
   a) O_2 b) CO c) N_2 d) SO_2

10. The movement of carbon between_____ is called carbon cycle,
    a) Atmosphere and biosphere
    b) Atmosphere and hydrosphere
    c) Geosphere and atmosphere
    d) Biosphere, atmosphere, hydrosphere and geosphere

11. The ground water depends on,
    a) Amount of rain fall
    b) Geological formations
    c) Run off
    d) All of these

12. The important three minerals mined into the maximum extent are,
    a) Coal, petroleum and mercury
    b) Coal, Petroleum and Iron
    c) Petroleum, Radium and Xenon
    d) Helium, Xenon and Coal

13. Respiration and photosynthesis are the keywords related to,
    a) Nitrogen cycle
    b) Sulphur cycle
    c) Carbon cycle
    d) Hydrological cycle.

14. Mining means,
    a) To conserve and preserve minerals
    b) To check pollutions due to mineral resources
    c) To extract minerals and ones
    d) None of these

15. The most important fuel used by nuclear power plant is,
    a) V-235 b) V-238 c) V-245 d) V-248

16. The pH value of the acid rain water is,
    a) 5.7
    b) 7.0
    c) 8.5
    d) 7.5

17. Which of the following is not a Green house gas?
    a) Hydro chloroflourocarbons
    b) Methane
    c) CO_2
    d) SO_2

18. E.I.A can be expanded as,
    a) Environment and Industrial Act
    b) Environment and impact activities
    c) Environment Impact Assessment
    d) Environment Important Activity

19. The environmental (protection) act 1986 deals with:
    a) Water
    b) Air
    c) Soil
    d) All of these

20. The first of the major environmental protection act to be promulgated in India was:
    a) The wild life protection act
    b) The air act
    c) The noise pollution act
    d) None of these

21. The meaning of global warming is,
    a) Increase in the temperature of climate
    b) A planet hotter than earth
    c) Solar radiation
    d) Cooling effect

22. Biogas is produced by,
    a) Microbial activity
    b) Harvesting crop
    c) Both (a) and (b)
    d) None of these

23. Biomass consists of,
    a) Lignin
    b) Hemi cellulose
    c) Cellulose
    d) All of these

24. Petroleum based vehicles emit traces of,
    a) CO and NO_x
    b) SPM
    c) Aldehydes
    d) CH_4

25. Urbanization is,
    a) Local environmental issue
    b) National environmental issue
    c) Both (a) and (b)
    d) Not at all an issue

26. Noise pollution limits in industrial area,
    a) 45 dB
    b) 80 dB
    c) 65 dB
    d) 90 dB

27. Ozone layers absorbs,
    a) UV rays
    b) Infrared rays
    c) Cosmic rays
    d) CO

28. Water logging is a phenomenon in which,
    a) Crop patterns are related
    b) Plant nutrients
    c) Erosion of soil
    d) None of these

29. The natural nitrogen cycle is upset due to,
    a) Burning of fossil fuel
    b) Modern agricultural practice of releasing excess fertilization.
    c) Global warming
    d) Biogas production

30. Which of the following are natural sources of air pollution?
a) Volcanic eruption
b) Solar flair
c) Earthquake
d) All of these

31. Air pollution from automobiles can be controlled by fitting,
a) Electrostatic precipitator
b) Wet scrubber
c) Catalytic converter
d) All of these

32. Both power and manure provided by,
a) Nuclear plants
b) Thermal plants
c) Biogas plants
d) Hydroelectric plants

33. BOD means,
a) Biochemical oxygen demand
b) Chemical oxygen demand
c) Biophysical oxygen demand
d) All of these

34. Deforestation can,
a) Increase the rain fall
b) Increase soil fertility
c) Introduce silt in the rivers
d) None of these

35. Organic farming is,
a) Farming without using pesticides and chemical fertilizers
b) Enhances biodiversity.
c) Promotes soil biological activity.
d) All of these.

36. Chloro Fluro Carbon's (CFC) are,
a) Non toxic
b) Non flammable
c) Non carcinogenic
d) All of these

37. Which of the following statement is true?
a) Green plants are self nourishing
b) Producers depends on consumers
c) Biotic components includes all non-living components
d) Herbivores depend on Carnivores.

38. Major purpose of most of the Dams around the world is,
a) Power generation
b) Drinking water supply
c) Flood control
d) Irrigation.

39. Major causes of deforestation are,
a) Shifting cultivation
b) Fuel requirements
c) Raw materials for industries
d) All of these

40. Smog is,
a) A natural phenomenon
b) Combination of smoke and fog
c) Colorless
d) All of these

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