

1E2205

Roll No. _____

Total No of Pages: **2****1E2205****B. Tech. I Sem. (Main) Exam., Dec. - 2017****CY-101 Engineering Chemistry****Time: 3 Hours****Maximum Marks: 80****Min. Passing Marks: 28***Instructions to Candidates:*

Attempt any five questions, including Question No.1 which is Compulsory. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL2. NIL

Q.1 Compulsory, Answer for each sub-question be given in about 25 words- [8×2=16]

- (a) Essential parameter of potable water.
- (b) What are Net Calorific Value (NCV) and a Gross Calorific Value (GCV) of fuel?
- (c) Calgon conditioning of boiler.
- (d) Properties of conducting polymers.
- (e) Industrial significance of viscosity measurement.
- (f) Water line corrosion.
- (g) Role of gypsum in cement.
- (h) Importance of annealing of glass.

Q.2 (a) Describe zeolite method of water softening with its limitations. [10]

- (b) Discuss preventive measures to minimize the problem of scale formation in boilers. [6]

- 5
- Q.3 (a) What is carbonization of coal? Explain Beehive coke oven method of coal carbonization. [12]
- (b) Explain the composition and uses of coal gas. [4]
- Q.4 (a) What do you mean by synthetic rubbers? Explain the manufacture properties and uses of Buna -S and Buna - N rubbers. [8]
- (b) Thick layer lubricating mechanism and application in machines. [8]
- Q.5 (a) Explain theory of wet electrochemical corrosion of metals. [8]
- (b) Discuss various methods for the prevention of corrosion. [8]
- Q.6 (a) What is cement? Explain manufacturing of cement by Rotatory kiln technology with diagram and reactions involved in the process. [10]
- (b) Calculate the requirement of Lime & Soda for softening 10^5 litres of water. [6]
- Analysis of water is as follows:-
- $\text{HCO}_3^- = 396.5 \text{ mg/Lit} ; \text{Mg}^{+2} = 42 \text{ mg/Lit}$
- $\text{Ca}^{++} = 90 \text{ mg/Lit} ; \text{H}^+ = 1.5 \text{ mg/Lit}$
- $\text{FeSO}_4.7\text{H}_2\text{O} = 14 \text{ mg/Lit}$
- The purity of Lime is 91% and that of Soda is 97.2%
- Q.7 (a) What do you mean by refractory material? Explain important properties of refractories. [8]
- (b) Describe manufacturing, properties and uses of Silica glass. [4]
- (c) Calculate the gross and net calorific values of a coal sample having the following composition: [4]
- $\text{C} = 80\% ; \text{H} = 07\% ; \text{O} = 03\% ; \text{S} = 3.5\% ; \text{N} = 2.1\% \text{ and ash} = 4.4\%$
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1E2202

Roll No. _____

Total No of Pages: **3****1E2202**

B. Tech. I Sem. (Main) Exam., Dec. - 2017
HU-101 Communication Skills

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks: 28

Instructions to Candidates:

Attempt any five questions, including Question No.1 which is Compulsory. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL2. NIL

Q.1 Compulsory, Answer for each sub-question be given in about 25 words- [8×2=16]

- (a) Give a definition of Nouns.
- (b) Define Communication.
- (c) Give two examples of direct speech.
- (d) What are Modal Verbs?
- (e) What do you mean by Business Correspondence?
- (f) Who wrote the short story "The Night Train" and "The Luncheon"?
- (g) Name the qualities of a paragraph.
- (h) Why did Kipling write the poem "If"?

Q.2 Correct the following sentences-

[8×2=16]

- (a) We can not imagined it.
- (b) Ramu does not cleans the rooms daily.
- (c) Let her watered the plants.
- (d) We shall be watch the movie.
- (e) Do your grandmother not like to read religious books?
- (f) Neither Kim nor Shelby are to go into the cave.
- (g) This gift is for Susie and I.
- (h) Unless you work hard, you will pass.

Q.3 Write an application for job for the post of Junior Manager, accompanied with a detailed CV, inventing all relevant details. [8+8=16]

Q.4 Describe the communication cycle. Distinguish between formal and informal channels of communication. [8+8=16]

Q.5 What are different types of Reports? Write a report on a road accident. [8+8=16]

Q.6 Answer the following questions- [4×4=16]

- (a) Explain what does the poet mean by 'Where knowledge is free'?
- (b) Give a gist of "No Men are Foreign".
- (c) "Beneath all uniform....." what uniforms is the poet speaking about?
- (d) Describe the main idea of the poem "Where the Mind is without Fear."

[4×4=16]

Q.7 Answer the following questions-

- (a) How did the author of the story "The Luncheon" use to make money twenty years ago? Where did he live?
- (b) Why did he decide to invite the lady for luncheon? Where did he invite her? What kind of the restaurant was it?
- (c) What is the aim or objective of the short story "How Much Land Does a Man Need?" by Leo Tolstoy?
- (d) Outline the important incidents of "The Night Train."

1E2203	Roll No. _____	Total No of Pages: 2
1E2203 B. Tech. I Sem. (Main) Exam., Dec. - 2017 HU-103 Human Values		

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks: 28

Instructions to Candidates:

Attempt any five questions, including Question No.1 which is Compulsory. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL

2. NIL

Q.1 Compulsory, Answer for each sub-question be given in about 25 words- [8×2=16]

- (a) How do values differ from skills?
- (b) What is the difference between wealth and prosperity?
- (c) Distinguish between need of self and need of body.
- (d) What do you understand by the terms Svatva, Swatantrata and Swarajya.
- (e) What is the comprehensive human goal?
- (f) What are the four orders in nature?
- (g) What is the difference between units and space?
- (h) What do you mean by profession?

Q.2 What are the basic guidelines for value education? [16]

Q.3 What is the difference between human consciousness and animal consciousness?

Explain with the help of a diagram. [16]

Q.4 Lack of harmony in the self has a strong influence on the health of the body.

Discuss. [16]

Q.5 Discuss the problems we face today due to preconditioned desires, thoughts and selections. [16]

Q.6 Respect for a human being is based on the evaluation on the basis of 'T'. Discuss. [16]

Q.7 Discuss the salient criteria for assessing and developing appropriate technologies, production systems and management models. [16]

1E2201

Roll No. _____

Total No of Pages: **3****1E2201****B. Tech. I Sem. (Main) Exam., Dec. - 2017****MA-101 Engineering Mathematics-I****Time: 3 Hours****Maximum Marks: 80****Min. Passing Marks: 28***Instructions to Candidates:*

Attempt any five questions, including Question No.1 which is Compulsory. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL2. NIL**Q.1 Compulsory, Answer for each sub-question be given in about 25 words:**

(a) Define concave upward and Concave downward. [2]

(b) If $u = \tan^{-1} \left(\frac{x^3 + y^3}{x - y} \right)$, prove that [2]

$$x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = \sin 2u$$

(c) Find the Jacobian $\frac{\partial(u, v)}{\partial(x, y)}$, where [2]

$$u = e^x \sin y, \quad v = x + \log \sin y$$

(d) Change the order of integration only in [2]

$$\int_0^1 \int_{e^x}^e \frac{dy \, dx}{\log y}$$

(e) Find the area, by double integration, bounded by parabola $y^2 = 4ax$ and its latus rectum.

[2]

(f) Find the directional derivative of $f(x, y, z) = 2x^2 + 3y^2 + z^2$ at the point $P(2, 1, 3)$

in the direction of the vector $\vec{a} = \hat{i} - 2\hat{k}$

[2]

(g) Prove that $\vec{F} = (y^2 \cos x + z^2)\hat{i} + (2y \sin x - 4)\hat{j} + (3xz^2 + 2)\hat{k}$ is a conservative field.

[2]

(h) Write the Cartesian formula of Gauss divergence theorem.

[2]

Q.2 (a) Find the asymptotes of the curve –

[8]

$$4x^3 - x^2y - 4xy^2 + y^3 + 3x^2 + 2xy - y^2 - 7 = 0$$

(b) Transform the integral $\int_0^a \int_0^{\sqrt{a^2-x^2}} y^2 \sqrt{x^2+y^2} dx dy$

[8]

by changing to polar coordinates, and, hence evaluate it.

Q.3 (a) Trace the curve $x^3 + y^3 = 3axy$

[8]

(b) Evaluate $\iiint_V x^2 dx dy dz$ over the region V enclosed by the planes

[8]

$$x = 0, y = 0, z = 0 \text{ and } x + y + z = a$$

Q.4 (a) Let $f(x, y) = \frac{x^3 - y^3}{x^2 + y^2}$, when $(x, y) \neq (0, 0)$ and $f(0, 0) = 0$. Show that the function

f is continuous but not differentiable at the origin.

[8]

(b) Prove that $\int_0^2 (8 - x^3)^{-1/3} dx = \frac{2\pi}{3\sqrt{3}}$

[8]

Q.5 (a) If $u = f(y - z, z - x, x - y)$, prove that $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = 0$ [8]

(b) Prove that $\text{div} (\mathbf{r}^n \vec{r}) = (n + 3) \mathbf{r}^n$ [8]

Q.6 (a) Use Taylor's theorem to expand $\sin xy$ in powers of $(x - 1)$ and $(y - \pi/2)$ up to second- degree terms. [8]

(b) Verify Green's theorem in the plane for $\int_C (xy + y^2) dx + x^2 dy$, where C is the closed curve of the region bounded by $y = x$ and $y = x^2$. [8]

Q.7 (a) Use Lagrange's method of multipliers to find the volume of the largest rectangular parallelepiped that can be inscribed in the ellipsoid. [8]

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$$

(b) Verify stoke's theorem for the vector field $\vec{F} = (x^2 - y^2) \mathbf{i} + 2xy \mathbf{j}$, integrated around the rectangle $z = 0$ and bounded by the lines $x = 0$, $y = 0$, $x = a$ and $y = b$. [8]

1E2206

Roll No. _____

Total No of Pages: 2**1E2206****B. Tech. I Sem. (Main) Exam., Dec. - 2017****CS-101 Computer Programming - I****Time: 3 Hours****Maximum Marks: 80****Min. Passing Marks: 28***Instructions to Candidates:*

*Attempt any **five** questions, including Question No.1 which is Compulsory. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL2. NIL

Q.1 Compulsory, Answer for each sub-question be given in about 25 words- [8×2=16]

- (a) Write application areas of Computer.
- (b) What is Memory? Differentiate SRAM and DRAM.
- (c) Explain Von Neumann Architecture.
- (d) What do you mean by programming languages? Why we learn programming.
- (e) Differentiate between flowchart and pseudo code.
- (f) What is Keyword? Write names of Keywords available in C.
- (g) List arithmetic, relational, logical and assignment operators.
- (h) What is function? Explain its two categories.

Q.2 What is Computer? Explain its characteristics, working & block diagram of Computer System. [16]

Q.3 Discuss various types of memory. Explain primary and secondary memory in detail. [16]

Q.4 Draw a flow chart to check whether the given number is EVEN or ODD. [16]

Q.5 Convert the following numbers- [8×2=16]

(a) $(1111001.1101)_2 = (?)_{10}$

(b) $(1010101)_2 = (?)_{10}$

(c) $(45)_8 = (?)_{10}$

(d) $(35)_{10} = (?)_8$

(e) $(70)_{16} = (?)_2$

(f) $(11101101)_2 = (?)_{16}$

(g) $(1010)_2 + (1010)_2$

(h) $(1111)_2 - (1010)_2$

Q.6 Write a program to read Marks of five subjects and print division. [16]

Percentage	Division
≥ 60	First
$\geq 48 \text{ \& } \leq 59$	Second
$\geq 36 \text{ \& } \leq 47$	Third
< 36	Fail

Q.7 Write program to print: - [16]

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1E2207

Roll No. _____

Total No of Pages: **2****1E2207**

B. Tech. I Sem. (Main) Exam., Dec. - 2017
CE-101 Environmental Engineering and Disaster
Management

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks: 28

Instructions to Candidates:

*Attempt any **five** questions, including Question No.1 which is Compulsory. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly. Use of following supporting material is permitted during examination. (Mentioned in form No. 205)*

1. NIL2. NIL

Q.1 Compulsory, Answer for each sub-question be given in about 25 words- [8×2=16]

- (a) Distinguish between biotic & abiotic Components.
- (b) Define turbidity.
- (c) Enlist various types of solid waste.
- (d) Define green house effect.
- (e) What is noise?
- (f) Name various types of disasters.
- (g) How can we calculate risk?
- (h) What are the different types of impurities present in water?

- Q.2 (a) What are the functions of state pollution control board? [8]
- (b) Discuss the steps taken by Rajasthan government in the direction of rain water harvesting. [8]
- Q.3 (a) What are the adverse effects of environmental pollution? [8]
- (b) What are the various components of waste water treatment? Discuss waste water treatment with flow chart. [8]
- Q.4 (a) Describe the proper ways for the disposal of solid waste by the municipal societies. [8]
- (b) How the air pollutants can be classified? [3]
- Q.5 (a) Discuss various measures to control air pollution? [8]
- (b) Explain the harmful effects of noise pollution. [8]
- Q.6 (a) Discuss any four major breakdown of the world in last 50 years. [8]
- (b) Discuss the vulnerability of Indian continents to different types of disaster. [8]
- Q.7 (a) What are the impacts of nuclear and chemical hazards? What measures should be taken against that type of Hazards? [8]
- (b) Explain any two hydrometeorological based disasters. [8]
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1E2003

Roll No. _____

Total No of Pages: 4**1E2003**

B. Tech. I Sem. (Back) Exam., Dec. - 2017
103 (O) Engineering Physics - I

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks: 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
 (Mentioned in form No. 205)*

1. NIL2. NIL**UNIT-I**

- Q.1 (a) Explain the working of Michelson's interferometer with the help of schematic diagram. How will you use it to measure wavelength separation between two closely spaced lines (say D_1 and D_2 lines) of Sodium lamp? [4+6=10]
- (b) What happens in case of Newton's rings if Plano-convex lens is replaced by a Plano-concave lens? [3]
- (c) In a Newton's ring experiment, the diameter of 10th ring changes from 1.50 cm to 1.25 cm when a liquid is introduced between the lens and the plate. Calculate the refractive index of the liquid. [3]

OR

Q.1 (a) How will you measure wavelength of light used in Newton's ring experiment?

Derive the formula used.

[7+3=10]

(b) Explain why a thin film illuminated with white light exhibits many colours? [3]

(c) When the movable mirror of Michelson's interferometer is moved through 0.05896 mm, a shift of 260 fringes is observed. What is the wavelength of light used? [3]

UNIT-II

Q.2 (a) Using the concept of electric vector of electromagnetic wave, discuss plane, circularly and elliptically polarized light in detail. [10]

(b) How will you differentiate the three sources of light having the same physical appearance; partially polarized, elliptically polarized and mixture of unpolarized and circularly polarized light. [3]

(c) 90 gm of impure sugar when dissolved in a litre of water gives an optical rotation of 10.9° when placed in a tube of length 20 cm. If use specific rotation of sugar is $66^\circ(\text{cm})^{-1}(\text{gm/cc})^{-1}$, find the percentage purity of Sugar sample. [3]

OR

Q.2 (a) Describe the construction and working of Biquartz's Polarimeter. How it is used to determine the specific rotation of glucose solution. [6+4=10]

(b) Explain the working of a Nicol prism. Mention its limitations. [3+1=4]

(c) Plane polarized light is incident on a piece of quartz cut parallel to optic axis. What is the least thickness for which the ordinary and the extraordinary rays combine to form plane polarized light.

(Given $\mu_o = 1.5442$, $\mu_E = 1.5533$ and $\lambda = 5000 \text{ \AA}$) [2]

UNIT-III

- Q.3 (a) Discuss the phenomenon of Fraunhofer's diffraction at single slit and show that the relative intensities of successive maxima are

$$1 : \frac{4}{9\pi^2} : \frac{4}{25\pi^2} : \frac{4}{49\pi^2} : \dots \quad [10]$$

- (b) In particular grating the Sodium doublet (5890 \AA and 5896 \AA) is viewed in 4th order at 86° to the normal and is barely resolved. Find-

- (i) the grating spacing
(ii) the resolving power of grating, and
(iii) the least wave length difference, that can be resolved

[2+2+2=6]

OR

- Q.3 (a) Explain Rayleigh criterion for resolution and apply it to deduce an expression for due resolving power of a diffraction grating.

[3+6=9]

- (b) Derive the condition of absent spectra in diffraction grating.

[3]

- (c) Diffraction pattern of a single slit of width 5 mm is formed by a lens of focal length 50 cm. Calculate the distance between the first dark and the next bright fringe from the axis. (Given $\lambda = 5000 \text{ \AA}$).

[4]

UNIT-IV

- Q.4 (a) Describe the formation of energy bands in solids and hence explain how it helps to classify the solids into conductor, semiconductor and insulators

[6+4=10]

- (b) Why, crystals are suitable for the study of diffraction of X-rays.

[2]

- (c) A semiconducting crystal 10 mm long, 6 mm wide and 2 mm thick has a magnetic flux density of 0.6 Weber/m^2 applied from front to back perpendicular to the largest faces when a current of 20 mA flows length wise through the specimen, the voltage measured across its width is to be $38 \mu\text{V}$, what is the Hall coefficient of this semiconductor.

[4]

OR

- Q.4 (a) Explain the terms mobility of charge carriers and Hall Effect. Obtain an expression for the Hall coefficient in terms of the density of conduction electrons and explain how it is used to determine the mobility of charge carriers. [2+2+6+2=12]
- (b) Derive an expression for the band gap of a semiconductor and explain how it is calculated experimentally. [4]

UNIT-V

- Q.5 (a) State the postulates of the special theory of relativity and derive the expression for velocity transformation. [2+8=10]
- (b) Prove that the particle having rest mass zero is always moving with velocity of light. [3]
- (c) A stationary body explodes into two fragments each of rest mass 2.0 kg that moves apart at speeds of $0.8c$ relative to the original body. Find out the rest mass of the original body. [3]

OR

- Q.5 (a) Derive relativistic expression for the mass of a particle moving with velocity- v [8]
- (b) What is relativity of simultaneity and relativity of colocality? Explain. [4]
- (c) A radioactive atom moves with a velocity $v = 0.2c$ along the x - axis of the system s . It emit a β - particle of velocity $0.85c$ relative to the system s' in which the radioactive atom is rest. Find its speed relative to s . [4]

1E2002

Roll No. _____

Total No of Pages: 4

1E2002

B. Tech. I Sem. (Back) Exam., Dec. - 2017

102 (O) Engineering Mathematics-I

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five** questions, selecting **one** question from each unit. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL

2. NIL

UNIT-I

Q.1 (a) Find the asymptotes of the following curve: [8]

$$x^3 + 3x^2y - 4y^3 - x + y + 3 = 0$$

(b) Prove that the radius of curvature at any point (x, y) on the Astroid

$x^{2/3} + y^{2/3} = a^{2/3}$ is three times the length of the perpendicular from the origin on the tangent at that point. [8]

OR

Q.1 (a) Find the points of inflexion for the following curve: [8]

$$y(a^2 + x^2) = x^3$$

- (b) Trace the curve:

[8]

$$x^3 + y^3 = 3axy$$

UNIT-II

- Q.2 (a) If $u = f(r)$, where $r^2 = x^2 + y^2$ then prove that:

[8]

$$\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = f''(r) + \frac{1}{r} f'(r)$$

- (b) If $u = \sin^{-1}\left(\frac{x+y}{\sqrt{x}+\sqrt{y}}\right)$

[8]

Then by using Euler's theorem prove that:

$$x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = \frac{1}{2} \tan u$$

OR

- Q.2 (a) Find the percentage error in the area of an ellipse when an error of 1% is made in measuring its major and minor axis.

[8]

- (b) Find the extreme points and their nature for the function.

[8]

$$u = x^3 + y^3 - 3axy$$

UNIT-III

- Q.3 (a) Find the volume of the solid formed by the revolution of the loop of the curve: [8]

$$y^2(a+x) = x^2(a-x)$$

about the x - axis.

(b) Evaluate:

[8]

$$\iint_A y dx dy,$$

Where A is the region of integration bounded by the parabolas:

$$y^2 = 4ax \text{ and } x^2 = 4ay$$

OR

Q.3 (a) Evaluate the following integral by changing the order of integration:

[8]

$$\int_0^1 \int_x^{\sqrt{2-x^2}} \frac{x}{\sqrt{x^2+y^2}} dx dy$$

(b) Using Beta and Gamma function theory, prove that:

[8]

$$B(m,n) = \frac{\Gamma(m) \Gamma(n)}{\Gamma(m+n)}$$

UNIT-IV

Q.4 Solve the following differential equations:

[5+5+6=16]

(a) $x dy - y(1 + xy) dx = 0$

(b) $(1 + xy) x dy + (1 - xy) y dx = 0$

(c) $(y^3 - 2x^2y) dx + (2xy^2 - x^3) dy = 0$

OR

Q.4 Solve the following differential equations:

[5+5+6=16]

(a) $\frac{d^3y}{dx^3} - 2\frac{d^2y}{dx^2} + 4\frac{dy}{dx} - 8y = 0$

(b) $(D^2 - 2D + 1)y = x^2e^{3x}$

(c) $(D^3 + 2D^2 + D)y = e^{2x} + x^2 + x$

UNIT-V

Q.5 (a) Solve the following differential equation:

$$x^2 \frac{d^2 y}{dx^2} + 4x \frac{dy}{dx} + 2y = e^x \quad [8]$$

(b) Solve the following differential equation: [8]

$$(x+2) \frac{d^2 y}{dx^2} - (2x+5) \frac{dy}{dx} + 2y = (x+1)e^x$$

OR

Q.5 (a) Solve the following differential equation:

$$x^6 \frac{d^2 y}{dx^2} + 3x^5 \frac{dy}{dx} + a^2 y = \frac{1}{x^2} \quad [8]$$

(b) Apply the method of variation of parameters to solve the following differential equation:

$$(1-x) \frac{d^2 y}{dx^2} + x \frac{dy}{dx} - y = (1-x)^2 \quad [8]$$

1E2001

Roll No. _____

Total No of Pages: **3****1E2001****B. Tech. I Sem. (Back) Exam., Dec. - 2017
101 (O) Communicative English****Time: 3 Hours****Maximum Marks: 80
Min. Passing Marks: 26***Instructions to Candidates:**Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.**Units of quantities used/calculated must be stated clearly.**Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*1. NIL2. NIL**UNIT-I**

Q.1 Attempt any four sections :-

[4×4=16]**SECTION - A**

Rewrite the followings sentence as directed:-

[4]

(i) The doctor came to the hospital at 8.15 PM. (past perfect)

(ii) The patient died at 8.00PM. (Present perfect)

(iii) I purchased a new motorcycle. (Past continuous)

(iv) She will leave for Delhi tonight. (Present continuous)

SECTION - B

Convert the following sentences into Indirect speech:-

[4]

- (i) My friend said, 'I don't eat rice'
- (ii) Rashmi said to her brother, 'I have finished my work'.
- (iii) The boys said to the girls, 'we are going to hostel'.
- (iv) She said to her husband, 'Do you have some time for me?'

SECTION - C

Change the following sentences into passive voice:-

[4]

- (i) I haven't used this motorcycle.
- (ii) They may ban this film.
- (iii) She prepared lunch for her brother.
- (iv) The teacher punished the irregular students.

SECTION - D

Complete the following sentences using correct tenses. Hints are given to complete the sentences:-

[4]

- (i) If you had played well (win the match)
- (ii) If you drive carefully (save others' lives)
- (iii) If the petrol runs out (go on foot)
- (iv) If I had gone to America (meet the President)

SECTION - E

Insert appropriate Modal Verbs in the sentences given below. The intended meaning is given in brackets;

[4]

- (i) He study properly if he wants to get good marks. (compulsion)
- (ii) She oppose her father. (lack of courage)
- (iii) The doctor cure the patient. (ability)
- (iv) He smoke when he was a student. (Past Habit)

28

UNIT-II

Q.2 What is a report? Discuss its importance. [16]

OR

Q.2 Write a dialogue on any one topic- (250 words) [16]

- (i) A salesman at a motorcycle showroom and a young customer.
- (ii) Two old friends who are meeting after a long time.
- (iii) A father and his son.

UNIT-III

Q.3 Give the story of 'The Luncheon' [16]

OR

Q.3 What is the moral of the story, 'How much land does a man need?' How is it conveyed in the story? [16]

UNIT-IV

Q.4 How is Gandhi a universal man? What are his views about a world state? [16]

OR

Q.4 Give the theme of 'On the Rule of the Road.' [16]

UNIT-V

Q.5 What qualities does the father want his son to follow in 'If'? [16]

OR

Q.5 How does Kirkup say that all men are equal? [16]

1E2004

Roll No. _____

Total No of Pages: 2**1E2004****B. Tech. I Sem. (Back) Exam., Dec. - 2017****104 (O) Engineering Chemistry****Common to all Branch****Time: 3 Hours****Maximum Marks: 80****Min. Passing Marks: 26****Instructions to Candidates:**

Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal marks**. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL2. NIL**UNIT-I**

Q.1 (a) What is cracking? What are advantages of catalytic cracking process? Describe moving bed catalytic cracking process with the help of neat diagram. [12]

(b) Write notes on octane number. [4]

OR

Q.1 (a) Define synthetic petrol. Describe Fischer Tropsch process with the help of diagram. [8]

(b) Write notes on – Oil gas and Anti knocking agents. [4+4=8]

UNIT-II

Q.2 (a) What is C.V.? Explain the determination of calorific value of solid fuels. [8]

(b) Calculate the minimum weight of O₂ and air required for complete burning of 5.0 kg of coal, which containing 80% carbon and 15% hydrogen & rest is oxygen. [8]

OR

- Q.2 (a) Write short notes on -
- (i) Flue gas analysis by Orsat's apparatus [4]
 - (ii) Ultimate analysis [4]
- (b) A sample of coal was found to have the following percentage composition by weight - C = 80%, H = 5%, O = 12% S = 2% and ash = 1%. Calculate gross and net calorific value of coal sample by using Dulong's formula. [8]

UNIT-III

- Q.3 (a) Define conducting Polymers. Explain methods of preparing conducting Polymers. [8]
- (b) Short notes on -
- (i) Vulcanization [4]
 - (ii) Natural Rubber [4]

OR

- Q.3 (a) Explain preparation, properties & uses of fullerenes. [8]
- (b) Discuss the classification of polymers with examples. [8]

UNIT-IV

- Q.4 What is Portland cement? Write its composition. Describe the manufacturing process of cement by Rotary Kiln Technology. [16]

OR

- Q.4 What is glass? Describe the manufacturing process of ordinary glass and also discuss the uses of glass. [16]

UNIT-V

- Q.5 (a) Define Refractories. How are they classified? Give the essential requirements of a good refractory. [12]
- (b) Discuss RUL Test. [4]

OR

- Q.5 (a) Define the term lubricant and lubrication. What are the different type of lubricants? Discuss extreme pressure lubrication. [12]
- (b) Explain Flash and Fire Point. [4]

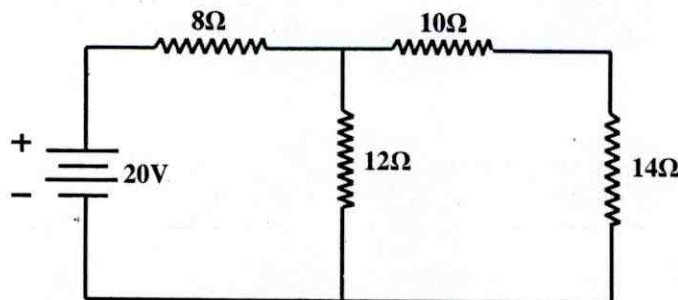
1E2005

Roll No. _____

Total No of Pages: 3**1E2005****B. Tech. I Sem. (Back) Exam., Dec. - 2017****105 (O) Basic Electrical and Electronics Engineering****Time: 3 Hours****Maximum Marks: 80**
Min. Passing Marks: 26*Instructions to Candidates:**Attempt any **five** questions, selecting **one** question from **each** unit. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.**Units of quantities used/calculated must be stated clearly.**Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*1. NIL2. NIL**UNIT-I**

Q.1 (a) State and explain Norton's theorem. Illustrate the application of this theorem with reference to an appropriate electric circuit. [8]

(b) Using Norton's theorem determine the current in 12-ohm resistor in the network shown in figure - (1) [8]

**Figure - 1**

OR

Q.1 (a) State and explain Thevenin's theorem. Illustrate the application of this theorem, with reference to an appropriate electric circuit. [8]

(b) Calculate current in 2-ohm resistor in the network shown in figure – (2). [8]

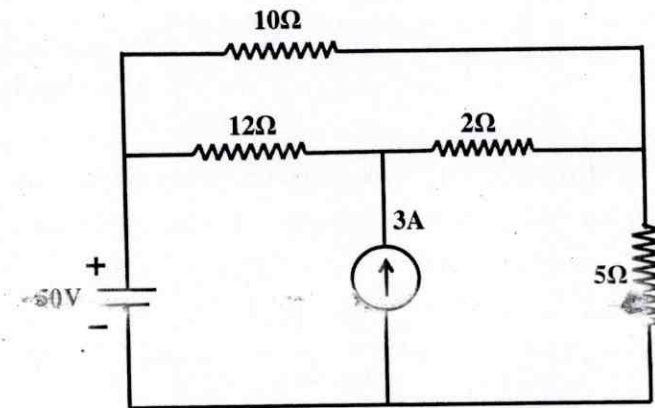


Figure – 2

UNIT-II

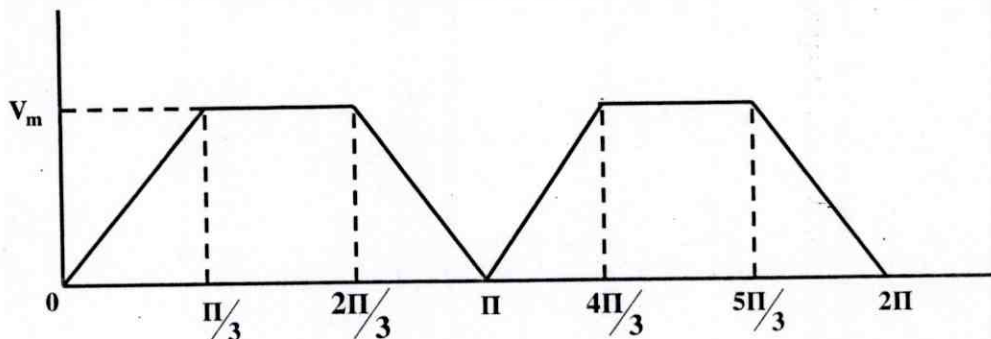
Q.2 (a) State and explain Form Factor and Peak Factor with required formulas. [8]

(b) A supply voltage of 230V, 50Hz is fed to a residential building. Write down its equation for instantaneous value. [8]

OR

Q.2 (a) What do you mean by Peak, average & R.M.S. values of sinusoidal current. [8]

(b) Find the average value of the Periodic function shown in figure – (3). [8]



Figure– 2

UNIT-III

- Q.3 (a) Explain the principle of D.C. machines and construction of D.C. machines. [8]
 (b) A 8 Pole DC machine has a wave winding containing 600 conductors. Calculate the generated emf. when flux per pole is 0.08 wb and speed is 215 rpm. If the flux per pole is mode 0.05 wb. At what speed should the armature be driven to generate 500V. [8]

OR

- Q.3 (a) Explain the principle and working of 3-Phase induction motor and explain type of 3-Phase induction motor. [8]
 (b) Describe the principle of operation of 3-Phase synchronous generator. [8]

UNIT-IV

- Q.4 (a) Realize the Ex-OR and Ex-NoR gates by using only NAND gates and only NoR gates. [8]
 (b) Discuss the behavior of P-n junction both when Forward bias and Reverse bias. Give suitable diagram wherever necessary. [8]

OR

- Q.4 (a) Sketch and explain the input and output characteristics curve for common collector configuration. [8]
 (b) Explain how Temperature effects the Properties of a semiconductor. [8]

UNIT-V

- Q.5 (a) What is the need of modulation? Compare the different types of modulation technique. [8]
 (b) Explain Load cell and bimetallic strip. [8]

OR

- Q.5 (a) Explain in detail the classification of ICS. [8]
 (b) Write a short note on - [8]
 (i) STRAIN GAUGES
 (ii) RTD

1E2204

Roll No. _____

Total No of Pages: **3**

1E2204

B. Tech. I Sem. (Main) Exam., Dec. - 2017

PY-101 Engineering Physics

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks: 28

Instructions to Candidates:

Attempt any five questions, including Question No.1 which is Compulsory. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL

2. NIL

Q.1 Compulsory, Answer for each sub-question be given in about 25 words- [8×2=16]

- What are coherent sources? How are they obtained in practice?
- On what factors does the dispersive power of a grating depend?
- What is the optic axis and the principle section of a crystal?
- Discuss the attenuation and dispersion of signals in optical fibre.
- What are the differences between spontaneous and stimulated emission?
- What do you understand by wave function?
- What is Laser? Explain its principle?
- Explain origin of bands in solids.

- Q.2 (a) With schematic diagram, explain the working of a Michelson's Interferometer. Obtain the expression for radii of circular interference fringes. How shall you use to measure wavelength separation between two closed spaced spectral line? [8]
- (b) Give a brief account of Interference filters. [4]
- (c) It is required to make on antireflection coating for light of wavelength 6000 \AA . If a thin film of $\mu = 1.25$ is to be coated on a glass plate of $\mu = 1.50$, what will be the minimum thickness of the film for normal incidence? [4]
- Q.3 (a) Derive an expression for the intensity distribution due Fraunhofer diffraction at a single slit and show that the intensity of the first subsidiary maxima is about 4.5% of that of principle maxima. [8]
- (b) What is half wave plate? What is its role in Laurent's half shade device? What are the requirements to be used in the above experiment? [4]
- (c) Calculate the least width of a grating having 800 lines per cm to resolve the Sodium D – lines of wavelength $\lambda_1 = 5890 \text{ \AA}$ and $\lambda_2 = 5896 \text{ \AA}$. [4]
- Q.4 (a) How does monochromaticity relates to temporal coherence? Define Q factor for a spectral line. [4]
- (b) Explain how light is propagated in a variable index fibre. Define numerical aperture and acceptance angle. Derive expressions for the same. [6]
- (c) An optical fiber has a line width of 1.5 nm and mean wavelength 550 nm with white light incident on the filter. Calculate: [6]
- Coherence length
 - Number of wavelengths in wave train.

- Q.5 (a) What are the basic requirements of a semiconductor laser? Draw its labelled diagram and explain its working with necessary theory. Write down the applications of semiconductor laser. [10]
- (b) What is holographic microscopy? With illustrative diagram show outlay of a holographic interferometer and explain its working. [6]
- Q.6 (a) Explain the terms, mobility charge carriers and Hall Effect. Obtain the expression of Hall coefficient in terms of current density and electronic charge. [8]
- (b) What are the differences between intrinsic and extrinsic semiconductors? Discuss the conduction mechanism through them. [4]
- (c) In Bragg's reflection of X – rays, a reflection was found at the glancing angle of 30° with lattice planes of spacing 1.87 \AA . If this is a second order reflection, then calculate the wavelength of x – rays. [4]
- Q.7 (a) Derive Schrödinger's time dependent equation. Explain the following: [12]
- Hamiltonian,
 - Physical significance of wave function, and
 - Normalized and orthogonal wave functions.
- (b) x – rays with $\lambda = 1 \text{ \AA}$ are scattered from a carbon block. The scattered radiation is viewed at 90° to the incident beam. [4]
- What is the Compton shift $\Delta\lambda$?
 - What kinetic energy is imparted to the recoil electron?