

**DEPARTMENT OF MATHEMATICS**  
**UNIVERSITY COLLEGE OF ENGINEERING (A) – O.U., HYD - 7**  
**B.E. (Common to All Branches) SEMESTER-II, I-CLASS TEST**  
**MATHEMATICS – II**

**TIME: 1 Hour**

**Max.Marks: 20**  
 $4 \times 2 = 8$

**PART – A**  
**Answer ALL questions**

1. Find the rank of the matrix  $A = \begin{bmatrix} 2 & 3 & 1 & 0 & 4 \\ 3 & 1 & 2 & -1 & 1 \\ 4 & -1 & 3 & -2 & -2 \\ 5 & 4 & 3 & -1 & 5 \end{bmatrix}$ .

2. If 1, 2, 3 are eigen values of a matrix  $A$  then find the trace of the matrix  $B = A^3 - A^2 + A^{-1}$ .

3. Find the general solution and singular solution of the differential equation  $y = x y' - \frac{(y')^2}{2}$ .

4. Show that the family of parabolas  $y^2 = 4a(x + a)$  is self orthogonal.

**PART - B**  
**Answer any THREE questions**  **$3 \times 4 = 12$**

5. Find the matrix  $A$  whose eigen values are 1, -1, 2 and the corresponding eigen vectors  $(1, 1, 0)^T, (1, 0, 1)^T, (3, 1, 1)^T$ .

6. Find the nature, index, signature of the quadratic form  $2x_1 x_2 + 2x_2 x_3 + 2x_3 x_1$ .

7. Solve  $x \frac{dy}{dx} + y = x^3 y^6$ .

8. (a) Solve  $(y^4 + 2y) dx + (x y^3 + 2y^4 - 4x) dy = 0$ .  
 (b) Solve  $(x^3 - 2y^2) dx + 2xy dy = 0$



# DEPARTMENT OF PHYSICS

University College of Engineering (A), O.U.  
B.E ½, II-Semester, Class Test – I : 2017-2018  
Subject: Engineering Physics – II

Time: 1 Hr.

Max. Marks : 20

## Part-A

**Note:** Answer all the questions. Each one carries '2' marks.

$$4 \times 2 = 8$$

- 1) What do you mean by lattice and unit cell.
- 2) Give the classification of solids based on the band theory.
- 3) Define the following
  - i) Frenkel defect
  - ii) Schottky defect
- 4) Calculate the transition temperature for lead, if the critical magnetic field is  $1/20^{\text{th}}$  of that at 0K if  $T_c = 4.8\text{K}$ .

## Part-B

**Note:** Answer any three questions from the following. Each one carries '4' marks.

$$3 \times 4 = 12$$

- 1) What is interplanar spacing? Derive the formula for calculating interplanar spacing of a cubical crystal.
- 2) Derive an expression for equilibrium concentration of Schottky defects in ionic crystals.
- 3) Explain Weiss molecular field theory on ferromagnetism.
- 4) What is superconductivity? Explain the BCS theory of superconductivity.

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$$\begin{aligned}H_c &= H \left(1 - \left(\frac{T}{T_c}\right)^2\right) \\ \frac{1}{20} &= \left(1 - \frac{T_u}{T_c}\right)^2 \\ \frac{19}{20} &= \frac{T_u}{T_c} \\ \frac{19}{20} &= \frac{0.87}{T_c} \\ T_c &= \end{aligned}$$

**UNIVERSITY COLLEGE OF ENGINEERING (A)  
DEPARTMENT OF CHEMISTRY**

**B.E I/IV-Semester II Class test -I-Feb 2018  
(FOR ALL BRANCHES)**

**Marks: 20**

**Time: 1hr**

**Part-A (Marks-6)**

**Note: Answer All Questions**

- 1) Define conductance & specific conductance and give their units. (1)
- 2) What is a fuel cell? Give an example. (1)
- 3) Explain effect of dilution on specific and equivalent conductance. (2)
- 4) Distinguish between primary & secondary batteries. (2)

**Part-B (Marks-14)**

**Note : Answer any two of the following**

- 1) a) State and explain Kohlrausch law and its applications. (4)
  - b) A conductance cell filled with 0.01N solution of an electrolyte offered a resistance of 280 ohms. If the electrodes of the cell are 1.82cm apart and have an area of cross-section equal to 4.64sq.cm calculate specific conductance and equivalent conductance of the electrolytic solution. (3)
  - 2) a) Explain the construction and working of Lead-Acid battery. Write down the reactions taking place during charging & discharging of the battery. (4)
  - b) How does a photovoltaic cell work? Explain. (3)
  - 3) a) Describe a method by which the  $P^H$  of an unknown solution is determined using Quinhydrone electrode. (4)
  - b) Write the Nernst equation & calculate the EMF of the following cell at 298K. (3)  
 $Mg/Mg^{+2}(0.001M)/Cu^{2+}(0.0001)/Cu$
-

DEPARTMENT OF ENGLISH  
UNIVERSITY COLLEGE OF ENGINEERING  
OSMANIA UNIVERSITY

Class Test – I

Feb 2018

Time: 1 hour

Max. Marks: 20

Note: Answer all the questions in the same order as they appear in the question paper.

Section A

I. Fill in the blanks with appropriate words. (2)

1. Submissive communication is also called \_\_\_\_\_ style of communication.
2. \_\_\_\_\_ is also called grapevine communication.

II. Match the following. (2)

- |                 |                                      |
|-----------------|--------------------------------------|
| 1. Open area    | a. unknown to self and others        |
| 2. Hidden area  | b. unknown to self, seen by others   |
| 3. Blind area   | c. known to self and others          |
| 4. Unknown area | d. known to self, hidden from others |

III. State whether the following statements are TRUE or FALSE. (2)

1. Aggressive style of communication involves striving for a win-win situation.
2. Information we gain about people before we even interact with them does have an impact on developing relationships.
3. Diagonal communication follows hierarchy.
4. All healthy interpersonal relationships have to be based on assertive communication.

IV. Write short notes on the following. (4)

1. Explain ABC's of technical communication.
2. What are the stages of Knapps relationship model?

Section B

Answer any two of the following questions in about 150 words each.

(10)

1. Write the importance of technical communication in professional career.
2. What are channels of communication? Explain each channel with supporting diagram.
3. What are organizational GDs? Explain brainstorming.

**DEPARTMENT OF ELECTRICAL ENGINEERING  
UNIVERSITY COLLEGE OF ENGINEERING  
OSMANIA UNIVERSITY (AUTONOMOUS)  
B.E I/IV (II-SEMESTER)**

**CLASS TEST-I**

**SUBJECT: BEE**

**TIME: 1 hour**

**MARKS: 20M**

Note: Answer all questions from part-A & any two questions from part-B

**PART-A** **4x2=8**

1. Draw a circuit diagram for measurement of power in a 3-Φ system by two watt meter method. Write expressions for power factor.
2. Write the EMF equation of transformer and explain each term?
3. With neat diagram state Superposition theorem?
4. Draw phasor diagram of RL circuit excited by sinusoidal input?

**PART-B** **2x6=12**

1. With a neat diagram explain phasor representation of sinusoidal quantities? (6M)
2. (a) Define Thevenin's and Norton's theorems? (2M)  
(b) With a neat diagram explain the OC & SC tests conducted on a single phase transformer? (4M)
3. (a) Draw the Phasor Diagram of a practical Transformer under on load condition. (2M)  
(b) Differentiate Star and Delta connection of balanced 3-Φ circuits. (4M)

**Department of Computer Science & Engineering**  
University College of Engineering(A), O. U, Hyderabad-07.

**Class Test – I**

**Class : B.E II Sem**

**Subject : OOPS**

**Time : 1 hour**

**Max. Marks : 20**

**PART – A**

**Answer ALL Questions**

**(3 x 2 = 6 marks)**

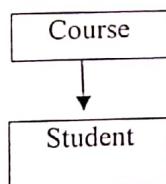
1. How is the ‘static’ keyword used in class. What is its use? (2)
2. Differentiate between procedure oriented programming & object oriented programming. (2)
3. Define Class & Object. (2)

**PART-B**

**Answer any TWO Questions**

**(2 x 7 = 14 marks)**

4. Discuss the basic concepts of OOPS with examples. (7)
5. a) Write a C++ program to define a student class having name, roll no, address for at least 10 students. Display and read the values. (7)  
b) Illustrate inheritance concept using the student class and course class (course ID, name, semester)



6. Explain about constructors (all types) and destructor with example. (7)

**DEPARTMENT OF MATHEMATICS**  
UNIVERSITY COLLEGE OF ENGINEERING (A) - O.U., HYD - 7  
B.E. (Common to All Branches) SEMESTER-II, CLASS TEST - II  
**MATHEMATICS - II**

**TIME: 1 Hour**

**Max.Marks: 20**  
 $4 \times 2 = 8$

**PART - A**  
Answer **ALL** questions

1. Find the wronskian of  $e^x, e^{2x}, e^{3x}$  at  $x = 1/6$ .
2. Using the method of reduction of order, solve  $(x-2)y'' - xy' + 2y = 0$ ,  $x \neq 2$  if  $y_1 = e^x$  is a solution of the equation.
3. Evaluate  $\int_0^\infty x^4 e^{-2x^2} dx$ .
4. Locate and classify the singular points of the differential equation  $x^3(x-2)y'' + x^3y' + 6y = 0$ .

**PART - B**  
Answer any **THREE** questions

**$3 \times 4 = 12$**

5. Solve  $y'' - 4y' + 4y = 16e^{2x} \cos x + x^2$ .
6. (i) Solve  $x^2y'' + 3xy' + y = 0$ .  
(ii) Solve  $(D^2 + 4)y = \sec 2x$  by the method of variation of parameters.
7. (i) Evaluate  $\int_0^p x^m (p^q - x^q)^n dx$  in terms of beta function where  $m, n, p, q$  are positive integers.  
(ii) Evaluate  $\frac{d}{dx} [erf(\alpha x)]$ .
8. Find the series solution of  $4x^2y'' - 8xy' + 5y = 0$ , by using Frobenius method (about  $x = 0$ ).

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**Department of Computer Science & Engineering  
University College of Engineering(A), O. U, Hyderabad-07.**

Class : B.E (CSE) II Sem  
Subject : OOP using C++

**Internal Examination - II**

Time : 1 hour  
Max. Marks : 20

**PART - A**

**Answer ALL Questions**

( $3 \times 2 = 6$  marks)

1. What is abstract data type ? Give example. (2)
2. Define Virtual Function. Give its syntax. (2)
3. What is an exception? How is it handled. (2)

**PART - B**

**Answer any TWO Questions**

( $2 \times 7 = 14$  marks)

1. What is Operator Overloading? Write a program using Friend Function overload  $\text{operator}++$ . (7)
2. Define Template. Implement a generic program for a class (Having 2 generic data types). (7)
3. Define stack data structure . Explain its oerations using array (7)

**DEPARTMENT OF PHYSICS**  
**University College of Engineering (A), O.U.**  
**B.E.1/4, II-Semester, Class Test-II: 2017-18**  
**Subject: Engineering Physics-II (All branches)**

**Time: 1 Hr.**

**Max. Marks: 20**

**Part-A**

**Note: Answer all the questions. Each one carries '2' marks.**

$$4 \times 2 = 8$$

1. What are ferroelectric materials? Give some examples.
2. Define (i) Dielectric constant and (ii) Polarizability.
3. Calculate the carrier concentration in intrinsic semiconductor when the mobilities of electrons and holes in a sample of germanium at 300K are  $0.36 \text{ m}^2\text{V}^{-1}\text{S}^{-1}$  and  $0.14 \text{ m}^2\text{V}^{-1}\text{S}^{-1}$ , respectively. The resistivity of the specimen is 2.2 Ohm-m.
4. List any four applications of superconductors.

**Part-B**

**Note: Answer any '3' questions from the following. Each one carries '4' marks.**

$$3 \times 4 = 12$$

1. Discuss the general properties of superconductors.
2. Explain different types of polarization briefly with neat diagrams.
3. What is Hall effect? Deduce an expression for Hall Coefficient.
4. Distinguish between p-type and n-type semiconductors. Derive an expression for the conductivity in an intrinsic semiconductor.

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**DEPARTMENT OF PHYSICS**

**University College of Engineering (A), O.U.**

**B.E.1/4, II-Semester: 2017-18**

**Subject: Engineering Physics-II: Quiz (All branches)**

**Max. Marks: 5**

**Time: 10 min.**

**Note: Answer all the questions. Each one carries '1/2' mark.**

$$10 \times 1/2 = 5$$

1. When  $E_f = E_i$   
a)  $n > p$       b)  $n < p$       c)  $n = p = 1$       d)  $n = p = n_i$
2. Momentum for a free particle is given by  
a)  $k\hbar$       b)  $k^2\hbar$       c)  $k^2\hbar^2$       d)  $1/r$
3. The diode current consists of  
a) Both the drift current and diffusion current      c) Reverse current  
b) Forward current      d) All of these
4. Space charge polarization is observed in .....
5. The BCS theory is based on ..... interaction.
6. Dielectric constant is  
a) always  $> 1$     b) always  $< 1$     c) always equals one    d) None of these
7. Density of states in the valence bond,  $N_v$  is proportional to .....
8. The isotope effect in a superconducting element states that  
a)  $T_c M^{3/2} = \text{const.}$       c)  $T_c M^{5/2} = \text{const.}$   
b)  $T_c M^{1/2} = \text{const.}$       d)  $T_c M^{2/2} = \text{const.}$
9. The fastest polarization is .....
10. The diode equation is valid .....

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**DEPARTMENT OF ELECTRICAL ENGINEERING  
UNIVERSITY COLLEGE OF ENGINEERING  
OSMANIA UNIVERSITY (AUTONOMOUS)**

**B.E I/IV (II-SEMESTER)**

**SUBJECT: BASIC ELECTRICAL ENGINEERING**

**CLASS TEST-II**

**TIME: 1 hour**

**MARKS: 20M**

Note: Answer all questions from part-A & any two questions from part-B

**PART-A (4x2=8)**

1. What is the significance of back EMF?
2. List out the applications of DC generators?
3. Why 1-Φ Induction motor is not self-starting?
4. What are the different types of losses in DC machines?

**PART-B (2x6=12)**

1. (a) Draw the neat sketch of 3-point starter and its operation. (4M)  
(b) Write the applications of Capacitor start-run motor? (2M)
2. Explain the constructional features and principle operation of a single phase induction motor.
3. a) Explain the Armature reaction of a D.C Machine.  
b) Write the differences between Armature control and flux control method.

**UNIVERSITY COLLEGE OF ENGINEERING (A)  
DEPARTMENT OF CHEMISTRY**

**B.E I/IV-Semester II Class test -II-March, 2018  
( CIV/MECH/EEE/ECE/CSE)**

**Time: 1hr**

**Marks: 20**

**Part-A (Marks-6)**

**Note: Answer All Questions**

- 1). Define Corrosion. Give an example. (1)
- 2). What is Gross and Net Calorific Value of a fuel ? (1)
- 3). Explain the Sacrificial Anodic Protection of corrosion. (2)
- 4). What are the requirements of a good fuel ? (2)

**Part-B (Marks-14)**

**Note : Answer any two of the following**

- 1) a). Discuss the Electrochemical theory of wet corrosion with mechanism. (4)
  - b) . Distinguish between Galvanization from Galvanic corrosion. (3)
  - 2) a). What is Proximate analysis of coal ? Explain with its significance. (4)
  - b). Calculate the Gross and Net Calorific value of coal sample having the following composition: C=80% ,H=7% ,O=3% ,S=3.5% ,N=2.1% and remaining ash. (3)
  - 3) a) Describe the method of fractional distillation of crude petroleum. (4)
  - b) What is a Paint ? What are its constituents and their functions ? (3)
-

Time: 1 hour  
1. State w  
2.  
3.

**DEPARTMENT OF CHEMISTRY**  
**QUIZ QUESTIONS**  
**FOR ALL BRANCHES (Except BME )**

Time: 10min.

**Marks: 5**

1. The process of separation of various fractions of petroleum is known as .....
2. Coating of Zn on Iron is called.....
- 3 .Volatile oxidation corrosion product of a metal is
  - a)  $\text{Fe}_2\text{O}_3$  b)  $\text{MoO}_3$  c) $\text{Fe}_3\text{O}_4$  d) $\text{FeO}$
4. Which of the following metal pair could provide cathodic protection to Fe
  - a) Al&Cu b) Al&Zn c)Zn&Cu d)Al&Ni
5. The rate of corrosion is.....if anodic areas are large and cathodic areas are small.
6. .....oils are used as vehicles in paints.
7. The calorific value of a coal sample is higher if its
  - a) Moisture content is high b) Volatile matter is high
  - c) Fixed carbon content is high d) Ash content is high
8. Ultimate analysis of a coal is determination of % of
  - a) C, H ,N, S &  $\text{H}_2\text{O}$  b) C, $\text{H}_2\text{O}$ ,ash&volatile matter c) Sulphur only d)Fixed carbon
9. The rate of corrosion increases with.....in  $\text{pH}$ .
10. The total quantity of heat liberated when a unit mass of the fuel is burnt completely is called  
.....

**FACULTY OF ENGINEERING**  
**B.E. I/IV (All Branches) II – Semester (Main) Examination**  
**BUSINESS COMMUNICATION and PRESENTATION SKILLS**

**ENGINEERING ENGLISH**

Time : 1 hour

Max Marks : 20

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**PART – A**

**A. State whether the following statements are TRUE or FALSE**

( $\frac{1}{2} \times 8 = 4$ )

1. A Complaint letter is a request for an adjustment.
2. A letter of inquiry is a request for information that the writer believes the reader can provide.
3. Being aggressive during the group discussion makes one to understand clearly.
4. Wearing a formal dress during an interview is not a code of success.
5. Statement of purpose is an application in the form of an essay submitted for a job.
6. A technical report is not based on facts.
7. When writing about your experiences in a statement of purpose it is important to be genuine.
8. Concise narration is never appreciated in a statement of purpose.

**B. Write short notes on the following.**

(2 x 3 = 6)

1. What are the case based Group discussions? Discuss.
2. What are the tips that help us to do well in an interview?
3. What is the difference between general report and technical report?

**PART – B**

**Answer any two of the following:**

(2 x 5 = 10)

1. Write a letter to Liphia Solutions, Hitech city, applying for the position of a software engineer.
2. Write a short statement of purpose in about 250 words concerning your purpose for undertaking or continuing Masters Study; your reasons for wanting to study at Osmania, and your research interests, professional plans, and career goals. You also may explain any special circumstances applicable to your background and elaborate on your scholarly publications, awards, achievements, abilities, and/or professional history.
3. As a student of BE write a report to the principal regarding the poor infrastructure facilities in the college. Mention your conclusions and suggestions in the report.

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**OSMANIA UNIVERSITY**  
**FACULTY OF ENGINEERING**  
**UNIVERSITY COLLEGE OF ENGINEERING (AUTONOMOUS)**  
**B.E (All Branches) II-Semester (Main) Examination**  
**April/May 2018**  
**MATHEMATICS-II**

**Time : 3 hours****Max. Marks : 70**

- Note:* i) First Question is compulsory and answer any four questions from the remaining six questions. Each question carries 14 Marks.  
ii) Answers to each question must be written at one place only and in the same order as they occur in the question paper.  
iii) Missing data, if any, may suitably be assumed.
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1. a) If 1, -1, 2 are eigen values of a matrix  $A$  then find the trace of the matrix [3]

$$B = A^3 + A^2 + A^{-1}.$$

- b) Find the general solution of the equation  $y' = 2x y^2 + (1-4x)y + 2x-1$  if [3]  
 $y=1$  is a particular solution.

- c) Solve  $(D^3 + 9D)y = \cos 3x$  where  $D \equiv \frac{d}{dx}$ . [3]

- d) Evaluate  $\int_0^\infty e^{-3x} x^4 dx$ . [3]

- e) Evaluate  $4p_3(x) + 6p_2(x) + 5p_0(x)$  as a polynomial of  $x$ . [2]

2. a) Find the matrix  $A$  whose eigen values are 1, 2, 3 and the corresponding eigen vectors are  $(1, 2, 1)^T, (2, 3, 4)^T, (1, 4, 9)^T$ . [7]

- b) Determine the values of  $a$  and  $b$  for which the system of equations  
 $3x - 2y + z = b, 5x - 8y + 9z = 3, 2x + y + az = -1$  [7]

has (i) a unique solution (ii) no solution (iii) infinitely many solutions

3. a) Find the orthogonal trajectories of the family of curves [7]  
 $\frac{x^2}{a^2} + \frac{y^2}{a^2 + \lambda} = 1$ ,  $\lambda$  being the parameter.
- b) Solve  $\frac{dy}{dx} + y \cos x = \frac{1}{2} \sin 2x$  [7]
4. a) Solve  $(D^3 + 8)y = x^4 + 2x + 1 + e^{-2x}$  where  $D \equiv \frac{d}{dx}$ . [7]
- b) Solve  $(x^2 D^2 + xD + 1)y = \log x \sin \log x$ . [7]
5. a) Find the series solution of the differential equation [7]  
 $2x^2 y'' - x y' + (1 - x^2)y = 0$ .
- b) Evaluate  $\int_0^\infty e^{-5x} (1 - e^{-x})^4 dx$ . [3]
- c) Evaluate  $\int_0^t \operatorname{erf}(2x) dx$ . [4]
6. a) Show that  $\int_{-1}^1 x p_n(x) p_{n-1}(x) dx = \frac{2n}{4n^2 - 1}$ ,  $n = 1, 2, 3, \dots$  [7]
- b) Show that  $J_3'(x) = \left( \frac{12}{x^2} - 1 \right) J_0(x) - \left( \frac{24}{x^3} - \frac{5}{x} \right) J_1(x)$ . [7]
7. a) Solve  $(D^2 - 3D + 2)y = \sin(e^{-x})$  by method of variation of parameters. [7]
- b) Solve  $(xy^3 + y)dx + 2(x^2y^2 + x + y^4)dy = 0$ . [7]

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$$\text{Ans} \int \frac{e^{-x}}{x} dx$$

$$\begin{aligned} u &= \sqrt{-x} \\ du &= \frac{1}{2\sqrt{-x}} dx \\ dx &= 2\sqrt{-x} du \\ &= 2u du \end{aligned}$$

$$\int 2u \cdot e^{u^2} \cdot u du$$

**OSMANIA UNIVERSITY**  
**FACULTY OF ENGINEERING**  
**UNIVERSITY COLLEGE OF ENGINEERING (AUTONOMOUS)**  
**B.E. (ECE,CSE) II-Semester (Main) Examination**  
**April/May 2018**  
**BASIC ELECTRICAL ENGINEERING**

**Time : 3 hours****Max. Marks : 70**

- Note:* i) First Question is compulsory and answer any four questions from the remaining six questions. Each question carries 14 Marks.
- ii) Answers to each question must be written at one place only and in the same order as they occur in the question paper.
- iii) Missing data, if any, may suitably be assumed.
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1. a) With the help of an example, prove Kirchoff's current law. [2]
- b) A series circuit  $R=100 \Omega$  and  $C=20\mu F$ . At what frequency will the current lead the voltage by  $30^\circ$ . [2]
- c) Which of the following does not change in transformer [1]
  - (a) current
  - (b) voltage
  - (c) frequency
  - (d) all of the above
- d) Three equal impedances each having a resistance of  $5 \Omega$  and reactance of  $4 \Omega$  are connected in delta to a 400 V, 3 phase, 50 Hz. Calculate the line current. [2]
- e) Write the differences between a separately excited and self excited generator. [2]
- f) Draw a typical torque-slip characteristics of a three phase induction motor. [2]
- g) Write the importance of earthing in electrical circuit. [2]
- h) The efficiency of a three phase induction motor is around 28% (True/False) [1]

2. a) State and Explain Thevenin's theorem. [5]
- b) A  $200 \Omega$  resistor, a  $10 \text{ H}$  inductor and a capacitor  $C$  are connected in parallel . (a) Find the equivalent impedance at  $\omega=100 \text{ rad/sec}$  if  $C=20 \mu\text{F}$  (b) Find the magnitude of the impedance when  $C=10 \mu\text{F}$  (c) At what value of  $\omega$  the magnitude of the impedance equal to  $100 \Omega$  if  $C=20 \mu\text{F}$ . [9]
3. a) Write the significance of OC and SC tests of transformer. [5]
- b) Three  $50 \Omega$  non-inductive resistances are connected in (i) star, (ii) delta across a  $400 \text{ V}, 50 \text{ Hz}, 3$  phase mains. Calculate the power taken from the supply system in each case. In the event of one of the three resistances getting opened, what would be the value of the total power taken from the mains in each of the two cases? [9]
4. a) Name the main parts of a DC generator and write the function of each part. [7]
- b) Determine the torque developed when a current of  $30 \text{ A}$  passes through the armature of a motor with the following particulars: lap winding, 310 conductors, 4-pole, pole area  $0.02748 \text{ sq.m}$  and flux density in air gap  $0.7 \text{ Tesla}$ . Derive the necessary equation. [4+3=7]
5. a) With a neat diagram, explain the principle of operation of three phase induction motor. [7]
- b) Explain star-delta starting method of three phase induction motor. [7]
6. a) Discuss in detail about flat rate tariff and two-part tariff methods. [9]
- b) Write the function of (i) fuse (ii) relay [5]
7. Write short notes on the following: [14]
- a) Armature reaction in DC Generator
- b) Three point starter
- c) Applications of DC motor

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**OSMANIA UNIVERSITY**  
**FACULTY OF ENGINEERING**  
**UNIVERSITY COLLEGE OF ENGINEERING (AUTONOMOUS)**  
**B.E. (All Branches) II-Semester (Main) Examination**  
**April/May 2018**

**BUSINESS COMMUNICATION AND PRESENTATION SKILLS**

**Time : 3 hours**

**Max. Marks : 70**

**Note:** i) First Question is compulsory and answer any four questions from the remaining six questions. Each question carries 14 Marks.

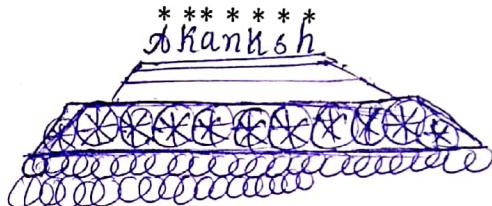
**ii)** Answers to each question must be written at one place only and in the same order as they occur in the question paper.

**iii)** Missing data, if any, may suitably be assumed.

*Answer the following questions.*

1. a) Horizontal communication [3]  
 b) Johari window [3]  
 c) Guidelines for writing a scientific report [3]  
 d) Format of résumé [3]  
 e) Preparation for interviews [2]
  
2. a) What is the importance of business communication? Write about ABC of technical communication. [14]
  
3. a) What are persuasion techniques? Explain. [7]  
 b) Write the dos and don'ts that one has to follow while communicating on mobile phone. [7]
  
4. a) Write seven differences between technical writing and general writing. [7]  
 b) Imagine that you are the Sales Manager of Dell company. Write a report on the progress of sales of laptops in the last six months. [7]

5. a) Write a letter of complaint to the MD of TSRTC on the non-maintenance of [7]  
timings of city buses in your route.
- b) Imagine that you are the Technical Head in a company of repute. You are [7]  
planning to convene a meeting with your team to discuss the technical issues  
raised and solved. Write the agenda of the meeting.
6. a) What are the features of a good GD? How to prepare for a group discussion? [7]
- b) What are the aspects one has to focus as part of preparation to farewell in a job [7]  
interview?
7. a) Write about the importance of time management in one's own professional [7]  
and personal life.
- b) Write a Statement of Purpose for the course you want to join, imagining that [7]  
you want to pursue higher education in IIT after your B.E.



**OSMANIA UNIVERSITY**  
**FACULTY OF ENGINEERING**  
**UNIVERSITY COLLEGE OF ENGINEERING (AUTONOMOUS)**  
**B.E (CSE) II-Semester (Main) Examination**  
**April/May 2018**

**OBJECT ORIENTED PROGRAMMING USING C++**

**Time : 3 hours**

**Max. Marks : 70**

- Note:*
- i) First Question is compulsory and answer any four questions from the remaining six questions. Each question carries 14 Marks.
  - ii) Answers to each question must be written at one place only and in the same order as they occur in the question paper.
  - iii) Missing data, if any, may suitably be assumed.
- 

1. a) Differentiate between Procedural programming and Object oriented programming. [1]

b) Write a function to take two parameters and increase the value of both parameter by 10. The function should be called in the main with two parameters and then changed value of the parameters should be printed. [2]

c) What is the Output of the following program? [1]

```
Class C1
{
    int a;
}
int main()
{
    C1 ob;
    ob.a=10;
    cout<< ob.a;
    return 0;
}
```

d) Write a function definition for function *one\_more*, which has a formal parameter for an array of integers and increases the value of each array element by one. Add any formal parameters as required. [2]

e) Differentiate between function overloading and function overriding with examples. [2]

f) Write a program that prompts the user to enter his age, height and weight. If the user enters a negative number or non digit, throw & handle the exception. [2]

- g) What is a pure virtual function? Give an example. [2]
- h) The contents of a stack are 2, 4, 6, 8, and 10, with 2 on top. What is the content of the stack after performing the following sequence of operations? push(3), push(5), pop(), push(1), pop(), pop(). [2]
2. a) Write a program to find the sum of digits of a more than 3 digits number and reverse of it. [7]
- b) Write a program to print the multiplication table. [7]
3. a) Discuss about formatting output. [7]
- b) Declare a structure student that contains three members namely name, rollno, marks. Write a program to read student information and print the student information in the sorted order of marks. [7]
4. a) What is constructors? Explain overloading of constructors with example. [7]
- b) Create a class Employee with 'calc\_salary' as one of the functions. Write a program to create two types of employee, permanent\_emp and temporary\_emp, and override calc\_salary function in both. [7]
5. a) Write a program to overload binary + operator to add two complex numbers where complex number is represented by an object of class having 2 data members one representing real and another representing the imaginary part of the complex number. [7]
- b) Write a template function that returns the average of all the elements of an array. The arguments to the function should be the array name and the size of array. In main(), exercise the function with arrays of type int, long, double. [7]
6. a) Write a C++ program to create a Queue and implement all the operations on a queue. [7]
- b) Write a function that has parameters for pointer to first element of a linked list of items and second argument for a possible item in the list. If the item is in the list, the function returns the position of the first occurrence of that item. If the item is not in the list, the function returns -1. [7]

- No. 1321/N  
[2]  
7. a) Write a program to implement class **Sale** and design the function **bill()** using virtual function. Derive classes **discount sale** and calculate the bill at a discounted rate less by 10%. Derive class **stock clearance sale** and calculate bill on a discounted rate less by 20%. Call the functions implementing run time polymorphism. [7]
- b) Write a program to overload pre and post increment operator [7]

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**UNIVERSITY COLLEGE OF ENGINEERING (AUTONOMOUS)**  
 B.E (Civil, EEE, ECE, Mech., CSE) II-Semester (Main) Examination  
 April/May 2018  
**ENGINEERING CHEMISTRY - II**

Max. Marks : 70

**Time : 3 hours**

- Note:**
- i) First Question is compulsory and answer any four questions from the remaining six questions. Each question carries 14 Marks.
  - ii) Answers to each question must be written at one place only and in the same order as they occur in the question paper.
  - iii) Missing data, if any, may suitably be assumed.
- 

- 1 a) Define the terms: [3]
- i) Specific conductance
  - ii) Equivalent conductance
  - iii) Molar conductance
- b) Differentiate primary and secondary batteries with suitable examples. [3]
- c) What is Pilling – Bedworth rule? Explain its significance. [3]
- d) Explain ultimate analysis of coal and its importance. [3]
- e) Write the characteristics of thermal insulators. [2]
- 2 a) The equivalent conductivities of HCl, NaCl and CH<sub>3</sub>COONa at infinite dilutions are 426.16, 126.45 and 91.0 S.cm<sup>-2</sup>.eq<sup>-1</sup> respectively. [7]
- Calculate the equivalent conductivity of acetic acid at infinite dilution. If the degree of dissociation of 0.1 N acetic acid is 0.001, find the equivalent conductance at this concentration of acetic acid.
- b) Define single electrode potential. How do you determine the single electrode potential of zinc electrode? [7]
- 3 a) What is Lead-acid battery? Explain charging and discharging reactions of it. [7]
- b) Briefly explain the concept of solar energy conversion. [7]

- 4 a) Explain how the corrosion can be controlled by Sacrificial anode and impressed e.m.f. methods. [7]
- b) Explain the factors effecting the rate of corrosion. [7]
- 5 a) A sample of coal was found to have the following percentage composition; C = 75%; H = 5.2%; O = 12.1%; N = 3.2% and ash = 4.5%. [7]
- i) Calculate the minimum air required for complete combustion of 1 Kg of coal.
- ii) Also calculate the higher calorific value and lower calorific value of coal sample. (Gross C.V. in K.Cal/Kg; C = 8,080; H = 34,500; S = 2,240).
- b) What are the requirements of a good fuel? Explain the advantages and disadvantages of a solid fuel. [7]
- 6 a) Explain Fibre-reinforced composites and its applications. [7]
- b) Classify the liquid crystals and mention their chemical constitution. [7]
- 7 a) Represent hydrogen, calomel and quinhydrone electrodes and write their electrodic reactions for reduction process. Write the S.R.P. values of the above three electrodes. [7]
- b) What are paints? Write their characteristics. Name the various constituents of paints. [7]

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**OSMANIA UNIVERSITY**  
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**UNIVERSITY COLLEGE OF ENGINEERING (AUTONOMOUS)**  
**B.E (All Branches) II-Semester (Main) Examination**

April/May 2018

**ENGINEERING PHYSICS-II**

**Time : 3 hours**

**Max. Marks : 70**

- Note:**
- i) First Question is compulsory and answer any four questions from the remaining six questions. Each question carries 14 Marks.
  - ii) Answers to each question must be written at one place only and in the same order as they occur in the question paper.
  - iii) Missing data, if any, may suitably be assumed.
- 

1. a) An X-ray radiation of  $\lambda=1.5\text{\AA}$  strikes a crystal of  $d$  spacing  $1.6\text{\AA}$ . Find the highest order for which Bragg's reflection maximum can seen. [2]
- b) State and explain Electron gas. [2]
- c) Write a short note on ferrites. [2]
- d) Define Raman Effect. [2]
- e) What is thermistor? [2]
- f) Draw the Hysteresis curve for soft and hard magnetic materials. [2]
- g) Mention the applications of Hall effect. [2]
2. a) Explain the crystal systems and corresponding Bravais lattices. [7]
- b) Explain the salient features of Kronig-Penny model and how it leads to energy band formation. [7]
3. a) Define superconductor? Distinguish between the Type-I and Type-II superconductors. [7]
- b) Explain magnetic domain-Hysteresis curve. [7]

4. a) Define Electronic polarization and calculate the polarizability due to electronic polarization. [7]
- b) State and explain Hall effect? Obtain an expression for Hall coefficient and mobility. [7]
5. a) Describe the construction and working of Scanning Electron Microscope (SEM). [7]
- b) What is meant by thin film? Explain the thermal evaporation method for the preparation of thin film. [7]
6. a) Explain in detail about the preparation of nanomaterials in Top-down (ball milling) method. [7]
- b) Discuss about the Elementary ideas of carbon nanotubes and write its applications. [7]
7. a) Derive an expression for the concentration of Frankel defect in ionic crystals. [7]
- b) What is Dielectric constant? Explain the experimental method of Schering bridge for the determination of dielectric constant. [7]

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