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R-17

Code: 7G513

I B.Tech. I Semester Supplementary Examinations March 2021

Basic Engineering Drawing
(Computer Science and Engineering)

Max. Marks: 70

Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

1. Construct a rectangular hyperbola, when a point P on it is at a distance of 18mm and 34mm from two asymptotes. Also draw a tangent to a curve at a point 20mm from an asymptote

OR

2. Construct a parabola, when the distance of the focus from the directrix is 50mm. Also draw tangent on normal to the curve at a point 35mm from the directrix

UNIT-II

3. A point is 50mm from both the reference planes. Draw its projections in all possible positions

OR

4. A line PQ, 90mm long, is in the H.P. & makes an angle 30° with the V.P. Its end P is 25mm in front of the V.P. Draw its projections

UNIT-III

5. A Circular plane of diameter 50mm is perpendicular to V.P. and parallel to H.P. The plane is 30mm above the H.P. Draw its projections

OR

6. A regular pentagon of 25mm side has one side on the ground. Its plane is inclined at 45° to the HP and perpendicular to the VP. Draw its projections

UNIT-IV

7. A pentagonal pyramid of side 30mm and axis length 50mm long is resting on H.P. on its base with a side perpendicular to the V.P. Draw its projections

OR

8. A hexagonal prism of side length 30mm is resting on V.P. on its base with a side perpendicular to the H.P. Draw its projections

UNIT-V

9. Draw the isometric projection of a circular plane of diameter 50mm when the plane is Horizontal

OR

10. Draw an isometric projection of the following planes both in the horizontal and the vertical positions

- i) A square plane of side 40mm
- ii) A rectangular plane 60mm x 80mm

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R-17

Code: 7GC12

I B.Tech. I Semester Supplementary Examinations March 2021

Engineering Chemistry
(Common to CE, ME & CSE)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

1. Explain in detail how hardness of a water sample is estimated by EDTA method. 14M

OR

2. a) How do you determine dissolved oxygen present in a water sample by Winkler's method? 7M

b) What is desalination? Explain desalination of water by reverse osmosis process. 7M

UNIT-II

3. a) What are secondary batteries? Give an account of Lithium ion batteries and Ni-Cd batteries 7M

b) What are potentiometric sensors? Explain their construction and working. Principle of potentiometric sensors 7M

OR

4. a) Explain various factors influencing corrosion of metals 7M

b) Explain the corrosion control by
i) cathodic protection and
ii) Impressed current cathodic protection 7M

UNIT-III

5. a) Write the differences between addition and condensation polymerization? 6M

b) Explain the preparation, properties and uses of Bakelite 8M

OR

6. a) Write the differences between thermoplastics and thermosetting plastics. 7M

b) Explain the process of processing of rubber? Mention the differences between natural and vulcanized rubber. 7M

UNIT-IV

7. a) Describe the Otto Hoffmann's method of manufacture of metallurgical coke with a neat labelled diagram 7M

b) Explain the manufacture, advantages and disadvantages of power alcohol 7M

OR

8. a) Describe the method of determination of calorific value of a solid fuel by using Bomb calorimeter with a neat labelled diagram 7M

b) A sample of Coal on analysis was found to contain the following. C = 76.0 %, H₂ = 5.2 %, O₂ = 12.0 %, S = 2.7 %, N₂ = 2.7 %, and ash = 2.2 %. Calculate the quantity of air required for complete combustion of 1 kg of this coal 7M

UNIT-V

9. a) Explain the important properties of a refractory material? 7M

b) Present a brief account on the following properties of lubricants
i) Flash and fire point ii) Mechanical stability iii) cloud and pour point 7M

OR

10. a) What are the raw materials used for manufacturing of Portland cement? Describe the method of manufacturing of Portland cement by wet process with the help of a rotary kiln. 8M

b) Explain the chemical reactions involved in setting and hardening process of cement? 6M

Code: 7GC14

I B.Tech. I Semester Supplementary Examinations March 2021

Engineering Mathematics-I

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

1. a) Define the rank of the matrix and find the rank of the following matrix

$$\begin{bmatrix} 2 & 1 & 3 & 5 \\ 4 & 2 & 1 & 3 \\ 8 & 4 & 7 & 13 \\ 8 & 4 & -3 & -1 \end{bmatrix}$$

- b) Test for consistency and solve
- $5x+3y+7z=4$
- ,
- $3x+26y+2z=9$
- ,
- $7x+2y+10z=5$

OR

2. Investigate the values of
- λ
- and
- μ
- so that the equations
- $2x+3y+5z=9$
- ,
- $7x+3y-2z=8$
- ,
- $2x+3y+\lambda z=\mu$
- , have (i) no solution, (ii) a unique solution and (iii) an infinite number of solutions.

UNIT-II

3. Find the transformation that will transform
- $10x^2 + 2y^2 + 5z^2 + 6yz - 10zx - 4xy$
- into a sum of squares

OR

4. Prove that
- $\frac{1}{2} \begin{bmatrix} i & \sqrt{3} \\ \sqrt{3} & i \end{bmatrix}$
- is a unitary matrix. Find its eigen values.

UNIT-III

5. If the temperature of a body is changing from
- 100°C
- to
- 70°C
- in 15 minutes, find when the temperature will be
- 40°C
- , if the temperature of air is
- 30°C
- .

OR

6. Solve
- $\frac{dy}{dx} + x \sin 2y = x^3 \cos^2 y$

UNIT-IV

7. Solve
- $\frac{d^2 y}{dx^2} + y = \cos ec x$
- by the method of variation of parameters.

OR

8. Solve
- $(D^2 - 1)y = x \sin x + x^2 e^x$

UNIT-V

9. Verify Rolles theorem for
- $f(x) = 2x^3 + x^2 - 4x - 2$
- in
- $[-\sqrt{2}, \sqrt{2}]$

OR

10. Let
- $r^2 = x^2 + y^2 + z^2$
- and
- $V = r^m$
- then prove that
- $V_{xx} + V_{yy} + V_{zz} = m(m+1)r^{m-2}$

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Code: 7G111

I B.Tech. I Semester Supplementary Examinations March 2021

Problem Solving Techniques and C Programming

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

- 1. a) Write an algorithm to check the given number is perfect number or not.
- b) List and explain various symbols used in flowcharts with figures

OR

- 2. Discuss about different computer languages with examples.

UNIT-II

- 3. Explain with examples the different types of operators used in C.

OR

- 4. a) Describe the structure of a C program with example
- b) Explain about data types in C programming language.

UNIT-III

- 5. a) In what way a do – while loop differs from while loop. Explain.
- b) Write a C program to find whether the given number is prime numbers or not.

OR

- 6. Explain the syntax of else if ladder and write a C program to read the value of x and evaluate the following function.

$$Y = \begin{cases} 1 & \text{for } x > 0 \\ 0 & \text{for } x = 0 \\ -1 & \text{for } x < 0 \end{cases}$$

Using else if statement and nested if statement.

UNIT-IV

- 7. Describe creation and initialization of two dimensional arrays and write a C program to perform sum of two matrices.

OR

- 8. Define string and explain various string input/output functions with suitable examples.

UNIT-V

- 9. What is function? Explain different parameter passing methods in functions with example.

OR

- 10. a) Explain about static and register storage classes.
- b) Write a C program to find factorial of a number using recursion.

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Code: 7GC11

I B.Tech. I Semester Supplementary Examinations March 2021

Technical English & Professional Communication

(Common to all Branches)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

1. a) Explain the concept of 'Technology with a Human Face' and state why modern technology does not enrich man but empties him.
- b) Fill in the blanks in the following sentences using the hints given in brackets.
 - i. The only way to ___ women is to give them education.(a word with the prefix em-)
 - ii. Once the process of contamination of water begins, it is __. (a word with the prefix ir-)
 - iii. My friend speaks English _____ and correctly. (freely, fluently)
 - iv. You have to _____ to many challenges in your life. (Phrasal verb with face)
 - v. The man is moving _____ the building. (at/ towards)

OR

2. Explain in brief the major elements of human communication.

UNIT-II

3. a) According to E.K. Federov what do human beings often tend to forget when engaging in large-scale developmental activities?
- b) Write a letter of application to the principal of your college requesting him/her to let you appear for terminal exams which you had skipped.

OR

4. Discuss the flow of communication.

UNIT-III

5. a) What are the two kinds of technologies currently used to generate solar power on a large scale?
- b) Complete the following sentences with appropriate words chosen from those in brackets:
 - i. How many _____ are there in each character in MS Word? (bytes/bites)
 - ii. Students are given an essay about the human _____ in the exam. (soul/sole)
 - iii. We saw a _____ and a tiger when we visited the local zoo.(boar/bore)
 - iv. Our _____took us through the Alps and then on to Italy. (route / root)
 - v. When it's low _____ you have to walk a long way before you can swim. (tide/tied)

OR

6. Explain the different types of Non-verbal communication in brief?

UNIT-IV

7. a) Discuss some of the measures that are used to prevent soil erosion.
- b) The management of your company proposes to establish a school near the factory site for the benefit of its staff. As Public Relations Officer you have been asked to study its feasibility and submit a report to the Personnel Manager, specially referring to the following: finance, teaching staff, library, games and sports, construction cost, etc.

OR

8. Discuss in detail the Discriminative and Comprehensive listening.

UNIT-V

9. Discuss the two ways in which one can work without expecting anything in return.

OR

10. Write in brief the different kinds of models of communication.
