B.Tech. I Year Supplementary Examinations May 2018
Engineering Drawing
(Common to EEE, ECE, CSE and IT)

Max. Marks: 70   Time: 3 Hours
Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)
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UNIT–I

1. Two straight lines OA and OB make an angle of 75˚ between them. P is a point 40 mm from OA and 50 mm from OB. Draw a hyperbola through P, with OA and OB as asymptotes, marking at least ten points.   14M

OR

2. A circle of 50 mm diameter rolls on the circumference of another circle of 175 mm diameter and outside it. Trace the locus of a point on the circumference of the rolling circle for one complete revolution. Name the curve. Draw a tangent and a normal to the curve at a point 125 mm from the center of the directing circle.   14M

UNIT–II

3. a) A point P is 15 mm above the H.P. and 20 mm in front of the V.P. Another point Q is 25 mm behind the V.P. and 40 mm below the H.P. Draw projections of P and Q keeping the distance between their projectors equal to 90 mm. Draw straight lines joining (i) their top views and (ii) their front views.   7M

   b) The front view of a line, inclined at 30˚ to the V.P. is 65 mm long. Draw the projections of the line, when it is parallel to and 40 mm above the H.P., its one end being 30 mm in front of the V.P.   7M

OR

4. The front view of a line AB measures 65 mm and makes an angle of 45˚ with xy. A is in the H.P. and the V.T. of the line is 15 mm below the H.P. The line is inclined at 30˚ to the V.P. Draw the projections of AB and find its true length and inclination with H.P. Also locate its H.T.   14M

UNIT–III

5. Draw a regular hexagon of 40 mm side, with it two sides vertical. Draw a circle of 40 mm diameter in its center. The figure represents a hexagonal plate with a hole in it and having its surface parallel to the V.P. Draw its projections when the surface is vertical and inclined at 30˚ to the V.P. Assume the thickness of the plate to be equal to that of a line.   14M

OR

6. A plate having shape of an isosceles triangle has base 50 mm long and altitude 70 mm. It is so placed that in the front view it is seen as an equilateral triangle of 50 mm sides and one side inclined at 45˚ to xy. Draw its top view.   14M

7. A square pyramid, base 40 mm side and axis 90 mm long, has a triangular face on the ground and the vertical plane containing the axis makes an angle of 45˚ with the V.P. Draw its projections. 14M

OR

8. Draw the projections of a cone, base 45 mm diameter and axis 50 mm long. When it is resting on the ground on a point on its base circle with the axis making an angle of 30˚ with the H.P. and 45˚ with the V.P. 14M

UNIT–V

9. A square pyramid base 40 mm side and axis 65 mm long, has its base on the H.P. and all the edges of the base equally inclined to the V.P. It is cut by a section plane, perpendicular to the V.P., inclined at 45˚ to the H.P. and bisecting the axis. Draw isometric projection of the retained part. 14M

OR

10. Draw front view, left side view and top view of the given isometric view. 14M

B.Tech. I Year Supplementary Examinations May 2018
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)
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UNIT–I

1. a) Solve $\dfrac{dy}{dx} + \dfrac{y}{x \log x} = \dfrac{\sin 2x}{\log x}$ 7M

    b) Prove that the system of confocal and coaxial parabolas $y^2 = 4a(x+a)$ is self
        Orthogonal   7M

OR

2. a) Solve $(D^2 - 4D + 3) y = \sin 3x \cos 2x$ 7M

    b) Solve $(D^2 + 1) y = \cos ec\, x \cot x$ by the method of variation of Parameter   7M

UNIT–II

3. a) Expand log(1+ eˣ) is ascending powers of x   7M

    b) If $u = \dfrac{x+y}{1-xy}$, $V = \tan^{-1} x + \tan^{-1} y$ then find $\dfrac{\partial(u,v)}{\partial(x,y)}$ 7M

OR

4. a) Examine the function for extreme values $f(x, y) = x^4 + y^4 - 2x^2 + 4xy - 2y^2$ 7M

    b) Find the volume of the largest rectangular parallelepiped that can be inscribed
        in ellipsoid $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} + \dfrac{z^2}{c^2} = 1$ 7M

UNIT–III

5.   Trace the curve $9 a y^2 = (x - 2a)(x - 5a)^2$ 14M

OR

6. a) Evaluate $\displaystyle\int_{0}^{a} \int_{0}^{\sqrt{a^2 - y^2}} \sqrt{a^2 - x^2 - y^2}\ dx.dy$ 7M

    b) Evaluate $\displaystyle\int_{0}^{1} \int_{y}^{1} \int_{0}^{1-x} x\ dz\ dx\ dy$ 7M

UNIT–IV

7. a) Find the Laplace Transforms of   i) $\sin 2t \sin 3t$ ii) $L\left\{ e^t \left(\cos 2t + \dfrac{\sinh 2t}{2} \right) \right\}$ 7M

    b) Using convolution theorem find $L^{-1}\left\{ \dfrac{s}{(s^2 + 1)(s^2 + 4)} \right\}$ 7M

OR

8.   Using Laplace transform solve $(D^2 + 2D - 3)y = \sin x$ if $y(0) = y^1(0) = 0$.   14M

UNIT–V

9. a) Find the directional derivative of $2xy + z^2$ at $(1, -1, 3)$ in the direction of   7M
        $\bar{i} + 2\bar{j} + 3\bar{k}$.

b) Show that Curl grad f = 0 where f is a scalar point function   7M

OR

10. Verify Green's theorem for $\int_C [(xy + y^2)dx + x^2 dy]$ where C is bounded by y = x

and y = x²   14M

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B.Tech. I Year Supplementary Examinations May/June 2018
Engineering Chemistry
(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)
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UNIT–I

1. a) Comment on hardness of water and mention any one of the method for estimation of hardness of water.   7M
    b) What are boiler troubles? Write a note on disadvantages of boiler troubles.   7M

OR

2. a) Explain the treatment of saline water by reverse osmosis in detail.   7M
    b) Write any one of the methods for purification of lake water for domestic purpose and comment on break point chlorine.   7M

UNIT–II

3. a) What are fuel cells? Write the working procedure for H_2-O_2 fuel cell   7M
    b) Write a note on lead-acid batteries with chemical reactions involving.   7M

OR

4. a) Explain any two methods for prevention of corrosions.   7M
    b) Explain the factors which effect the corrosion.   7M

UNIT–III

5. a) Differentiate between thermoplastics and thermosetting plastics   7M
    b) Write a brief notes on Vulcanization and compounding of rubber   7M

OR

6. a) What are conducting polymers? Explain the synthesis, mechanism and applications of polyacetylene.   7M
    b) Describe the preparation, properties and engineering applications of Buna-S and Buna-N rubbers   7M

UNIT–IV

7. a) Explain the classification of fuels and write the characteristics for good fuel   7M
    b) Explain Otto Hoffmann's by product oven process   7M

OR

8. a) Explain the following
        i) Knocking   **ii)** Octane number   **iii)** Cetane number   7M
    b) Compare the liquid fuels with gaseous fuels.   7M

UNIT–V

9. a) What is Portland cement? Describe the manufacture of Portland cement by wet method.   7M
    b) What is setting and hardening of cement? Explain various reactions involved in setting and hardening of cement   7M

OR

10. a) What are lubricants? Discuss any three properties of lubricants.   7M
    b) What are refractories? Discuss any three properties of refractories.   7M

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R-14

Code: 4G311

B.Tech. I Year Supplementary Examinations May 2018
Electronic Devices & Circuits
(Common to EEE & ECE)

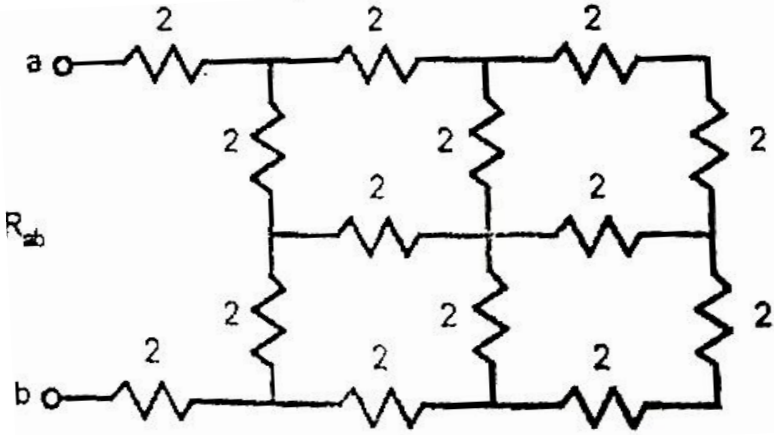Max. Marks: 70   Time: 3 Hours
Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)
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UNIT–I

1. a) Find the equivalent resistance R_{ab} for the circuit shown in the figure. All the resistor values shown are in ohms.

8M

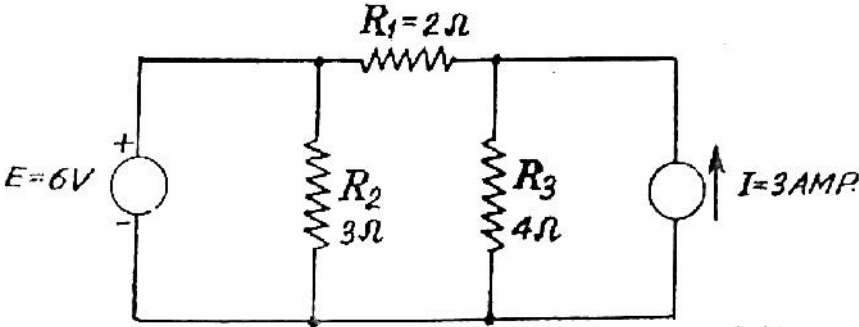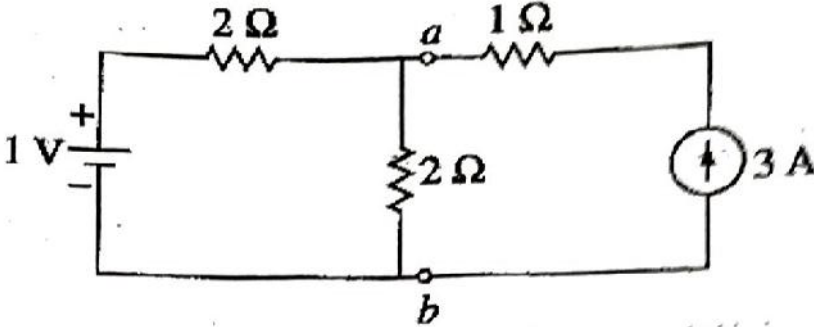   b) State maximum power transfer theorem. Derive the condition for transfer of maximum power to the load.   6M

OR

2. a) Find the current flowing through the resistor R_1 using Thevenin's theorem.

8M

   b) For the circuit shown in the figure, find the voltage across the terminals a and b using the source transformation.

6M

UNIT–II

3. a) Explain the temperature dependency of PN junction diode in detail with all necessary equations and graphs. 7M

   b) What are the advantages of LC filter compared to other filters? Derive the expression for ripple factor r in a LC filters 7M

OR

4. a) Define transition capacitance and derive the relation for the same. 7M

   b) Derive the expression for ripple factor r of a choke filter. What are the limitations of choke filter? 7M

UNIT–III

5. a) What is Thermal runaway? Derive the condition to prevent thermal runaways 7M

   b) What is the need for heat sinks? Draw the thermal resistance circuit for a transistor and derive the relation for power flow in a series thermal resistance circuit. 7M

OR

6. a) Explain the operation of the emitter bias circuit and derive the relation for stability factor S. 7M

   b) Explain any three techniques to construct a transistor. 7M

UNIT–IV

7. a) Explain in detail the characteristics of JFET indicating all the important points and regions on it. 7M

   b) What is the need for biasing in JFET? Explain and analyze the operating of a voltage divider bias. 7M

OR

8. a) Draw & explain the operation of voltage divider bias current using an n-channel MOSFET. 7M

   b) What is Q point? How to set a Q point for a gate biased FET circuit. 7M

UNIT–V

9 a) Describe how the construction of Schottky diode is significantly different from the conventional semiconductor diode. Describe its mode of operation. 7M

   b) Write short notes on the operation of LED and explain BJT controlled circuits for LED. 7M

OR

10. a) Define and indicate the typical values of UJT parameters: (i) Inter-base resistance (ii) Intrinsic stand-off ratio (iii) Emitter saturation voltage (iv) Peak point emitter current (v) Valley point current. 7M

    b) What are the essential differences between a semiconductor diode and a Tunnel diode? Explain the characteristics of a tunnel diode and draw the equivalent circuit diagram. 7M

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B.Tech. I Year Supplementary Examinations May/June 2018
Engineering Physics
(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)
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UNIT–I

1. a) Derive the expression of wave length of monochromatic light using Newton's
       rings setup?   11M

    b) A parallel beams of light with wavelength 5893Å is incident on a glass plate
       (μ=1.5) such that an angle of refraction into plate is 60^0. Calculate the
       smallest thickness of the plate which will make it appear dark by reflection.   3M

OR

2. a) With the help of suitable diagram, explain the construction and working of
       Ruby laser.   10M

    b) Mention the applications of lasers in different fields   4M

UNIT–II

3.   Derive the packing fractions for SC, BCC and FCC. Show that FCC is the
       most closely packed of three cubic structures..   14M

OR

4. a) Explain the working and construction of piezoelectric method of ultrasonic
       wave production.   10M

    b) Explain the different detection methods of Ultrasonic waves.   4M

UNIT–III

5. a) Show that the energies of a particle in a potential box are quantized.   10M

    b) Explain the Physical significance of wave function.   4M

OR

6. a) What are the salient features of classical free electron theory? Mention its
       merits and demerits.   7M

    b) On the basis of band theory, explain how the solids are classified into metals,
       semiconductors and insulators.   7M

UNIT–IV

7. a) Distinguish between intrinsic and extrinsic semiconductors.   4M

    b) Explain the I-V characteristics of p-n Junction diode.   6M

    c) Explain the direct and indirect band gap semiconductor   4M

OR

8. a) Explain Hysteresis Curve.   7M

    b) Distinguish between soft and hard magnetic materials   7M

UNIT–V

9. a) What is a superconductor? Write the general properties of superconductors   6M

    b) Explain the BCS theory of Superconductivity in detail.   8M

OR

10. a) Describe the method of chemical vapour deposition in nano materials preparation   6M

    b) Write the optical, thermal, mechanical and magnetic properties of Nanomaterials.   8M

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B.Tech. I Year Supplementary Examinations May 2018
Programming in C & Introudution to Datastructures
(Common to CE, EEE, ME & ECE)

Max. Marks: 70   Time: 3 Hours
Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)
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UNIT–I

1. a) Explain the importance of computer system?   8M
    b) Write an algorithm and flowchart on simple interest   6M

OR

2. a) Explain the structure of C programming with simple example   4M
    b) Write a program on calculating area and perimeter of square and rectangle.   10M

UNIT–II

3. a) Define an Array? Write a c program on display 10 numbers using an array   7M
    b) Write a C program to check whether the given number is Divisible by 3 or not   7M

OR

4. a) Write a C program to find whether the given Character is alphabet, Digit or
       any other   7M
    b) Write a C program to perform multiplication of two matrices   7M

UNIT–III

5. Define a recursive function? Write a C program to find the factorial of a given
    integer using recursive function   14M

OR

6. How to create dynamic memory allocation with suitable example   14M

UNIT–IV

7. a) Write a C program to write data to text file and read it   7M
    b) Write a c program on Quick sort?   7M

OR

8. a) What are the string manipulation functions? Write a c program to find length
       of the given string   7M
    b) Write a c program on Binary Search   7M

UNIT–V

9. Write a C Program to implement Queue using arrays   14M

OR

10. Write a C program to convert infix expression to postfix expression   14M

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